

# Materials & Furnishings Details

## Techo Bloc Concrete Pavers

### From Michael Vargason:

For all pavers, we want a dense finish. Washed, Tumbled, or Brushed finish might encourage salt to enter the paver and start to break it down.

For Techo Block, shale grey looks like the only color option with a range of shades.

### From Product Reps (tried to group responses to questions that came in through a bunch of different emails):

#### 1.) What is the warranty and what does it cover?

- Based on current practice in the USA and Canada for product warranty on ICI projects, we have decided to define our warranty for ICI projects to be **1 year minimum and according to contract bidding documents.**
- If you have any questions regarding this warranty you can contact Lincoln Paiva, our Director of Technical Service directly at 450-656-2992 ext 1377, or [Lincoln.paiva@techo-bloc.com](mailto:Lincoln.paiva@techo-bloc.com)

#### 2.) Do you recommend sealing the pavers?

- There are certainly a lot of benefits to sealing pavers. Sealing pavers, slabs and walls can help improve the beauty and longevity of your products much like waxing a car. Sealing them can enhance the color and make the product more stain resistant and easier to keep clean. The sealer also helps keep the joint sand in place. We typically leave that decision to the decision makers of the project.
- Sealing will certainly help with water absorption that helps prevent degradation but its mostly for esthetics and stain prevention.

#### 3.) Concrete mix design for pavers?

- Please let me know which products you are referring to. We have thousands of photos of completed projects, is there any in particular that you would like to see photos of?
- The concrete mix design is something that we do not typically distribute. However, I have attached multiple material and data sheets that may provide the information that you were looking for. Please let me know if this helps or if you have any other questions.

#### 4.) Any test results for pavers showing resistance to de-icing both chloride and non-chloride?

- Our products are manufactured to all US and Canadian standards, tested in over 100 freeze thaw cycles in a saline solution. With this being said, we have test results for individual products. If there are certain products you have in mind for this project I will be happy to provide the necessary information regarding this.
- Our pavers are 100% de-icing salt resistant and they do have a lifetime warranty on any defects should a problem arise, so I wouldn't be concerned about that. Sealing

the pavers will certainly protect them from oils and typical dirt associated with a paver in a commercial application and will to some degree help offset the de-icing salt issue. We suggest looking at the Alliance product line, depends on the finish you're looking for. <http://www.alliancegator.com/products/>

- As far as the pavers themselves, we have tested many times over with verified Freeze/ Thaw results, the structural integrity in northern climates is a non-issue.
  - o Mass Loss (Max):
  - o 225g/m at 28 cycles
  - o 500 g/m at 49 cycles
- We have several options as you mentioned, but if these are simply going into a streetscape, tree belt area, the Victorien permeable - 60mm is safe for light vehicular traffic, our Inflo would also be suitable, but not currently available in the 4 x 8" size. If you follow the link below, it will take you right to our spec book where we list all the ASTM Data for our products. Beginning on page Page 87, if you haven't been there yet, begins the section on our permeable pavers.
- 

5.) Projects sites where they have held up to conditions similar to Burlington over a long period?

- A project I would reference is our Stonedge manufacturing facility in St. Hubert Canada.
- Installed 7 years ago, de-icing salts are used regularly, this is a permeable application no sand is acceptable, it is plowed with a volvo D10 loader.
- This install sees over 200 loaded tractor trailers a day
- Please see the video link below to see scope of project.

<https://youtu.be/71drF5dMpAI>

- We have an installation in kittery ME thats 15 years old performing perfectly. Commercial side walks around kittery trading post. If you need photos I may be able to get them.

6.) Project owner references?

- This is certainly something that we can obtain. If there is a certain product or project that you are looking for we can certainly put you in touch.

7.) Any best practices that Techo-Bloc recommends for maintaining concrete pavers?

-We have recently added a care and maintenance section of our website, this should take you through the steps and best practices we recommend, if you have any questions please do not hesitate to contact me.

<https://www.youtube.com/watch?v=71drF5dMpAI&feature=youtu.be>

# Installation guide

## TYPICAL APPLICATION USAGE

| SECTOR  | TRAFFIC TYPE & APPLICATIONS  | PERMEABLE PAVERS   |
|---|--|--|
| RESIDENTIAL                                       |  <b>1. Light traffic</b><br>Cars and occasional light service trucks (ex. residential driveways)  | <ul style="list-style-type: none"> <li>- Antika</li> <li>- Blu 80 mm</li> <li>- Inflo</li> <li>- Mista Random</li> <li>- Pure</li> <li>- Victorien 60 mm permeable</li> <li>- Villagio</li> </ul>                      |
|   |  <b>2. Pedestrian</b><br>Pedestrian only and at all times (ex. patios)  | <ul style="list-style-type: none"> <li>- Antika</li> <li>- Blu 80 mm</li> <li>- Blu 60 mm</li> <li>- Inflo</li> <li>- Mista Random</li> <li>- Pure</li> <li>- Victorien 60 mm permeable</li> <li>- Villagio</li> </ul> |
| ICI<br>(Industrial, Commercial and Institutional) |  <b>3. Road traffic</b><br>Cars, heavy trucks, buses (ex. boulevards, main or secondary streets, pedestrian crossings, industrial, ports and airport areas) | <ul style="list-style-type: none"> <li>- Inflo</li> </ul>  |
|   |  <b>4. Light traffic</b><br>Cars and occasional light service trucks (ex. parking lots, sidewalks)  | <ul style="list-style-type: none"> <li>- Inflo</li> <li>- Pure</li> </ul>  |
|   |  <b>5. Pedestrian</b><br>Pedestrian only and at all times, without cars, or trucks or other mobile equipment (ex. terraces, parks, pedestrian walkways)     | <ul style="list-style-type: none"> <li>- Inflo</li> <li>- Pure</li> </ul>  |

# Installation guide

## INFILTRATION CHART

| PERMEABLE PAVERS                       | PERCENT OF SURFACE OPENING (%) | JOINT WIDTH (mm)              | INFILTRATION RATE <sup>1</sup> (mm/h) |
|--|--------------------------------|-------------------------------|---------------------------------------|
| ANTIKA <sup>2</sup>                    | Variable                       | Variable                      | 993 in./hr (25 227 mm/hr)             |
| BLU 80 mm <sup>2</sup>                 | 3.0                            | 9/32" (7 mm)                  | 570 in./hr (14 475 mm/hr)             |
| INFLO <sup>1</sup>                     | 5.8                            | 1/2" (13 mm)                  | 837 in./hr (21 267 mm/hr)             |
| MISTA RANDOM <sup>1</sup>              | 6.3                            | 3/16" (4 mm) to 9/16" (14 mm) | 610 in./hr (15 505 mm/hr)             |
| PURE <sup>2</sup>                      | 5.0                            | 3/8" (10 mm)                  | 726 in./hr (18 440 mm/hr)             |
| VICTORIEN 60 mm PERMEABLE <sup>1</sup> | 9.6                            | 3/8" (10 mm)                  | 909 in./hr (23 085 mm/hr)             |
| VILLAGIO <sup>1</sup>                  | 8.0                            | 3/8" (9 mm) to 9/16" (15 mm)  | 896 in./hr (22 750 mm/hr)             |
| PERMEABLE SLAB                         | PERCENT OF SURFACE OPENING (%) | JOINT WIDTH (mm)              | INFILTRATION RATE <sup>1</sup> (mm/h) |
| BLU 60 mm <sup>2</sup>                 | 3.0                            | 9/32" (7 mm)                  | 570 in./hr (14 475 mm/hr)             |

<sup>1</sup>Measurements were taken at various sites in conformity to the standard ASTM C 1701-09.

<sup>2</sup>Measurements were taken at various sites in conformity to the standard ASTM C 1781.

## OTHER PERMEABLE POSSIBILITIES

|   |   |   |   |   |
|---|---|---|---|---|
|  |  |  |  |  |
| Blu 60 mm<br>SLAB<br>(page 28 to 33)  | Antika<br>PAVER<br>(page 53)  | Blu 80 mm<br>PAVER<br>(page 55 to 59)   | Mista Random<br>PAVER<br>(page 76)  | Villagio<br>PAVER<br>(page 86)  |

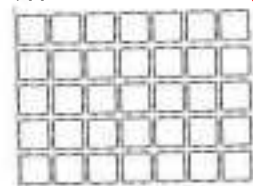




NEW  
**Valet**

DESCRIPTION: paver TEXTURE: Basalt

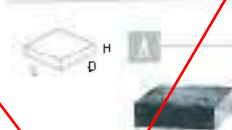
PALLET OVERVIEW



NOTES

See page 48 to 51 for more technical information.

| Specifications per pallet | Imperial              | Metric              |
|---------------------------|-----------------------|---------------------|
| Cubing                    | 92.31 ft <sup>2</sup> | 8.58 m <sup>2</sup> |
| Weight                    | 2 577 lbs             | 1 169 kg            |
| Number of rows            | 9                     |                     |
| Coverage per row          | 10.26 ft <sup>2</sup> | 0.95 m <sup>2</sup> |
| Linear coverage per row   | 18.95 lin. ft         | 5.78 lin. m         |



| Unit dimensions | in    | mm  | Units/pallet |
|-----------------|-------|-----|--------------|
| Height          | 2 3/8 | 60  | 315 units    |
| Depth           | 6 1/2 | 165 |              |
| Length          | 6 1/2 | 165 |              |



**Victorien 60 mm**

DESCRIPTION: Paver TEXTURE: Smooth

PALLET OVERVIEW



NOTES

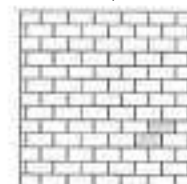
See page 48 to 51 for more technical information.

| Specifications per pallet | Imperial               | Metric               |
|---------------------------|------------------------|----------------------|
| Cubing                    | 123.70 ft <sup>2</sup> | 11.50 m <sup>2</sup> |
| Weight                    | 3 481 lbs              | 1 579 kg             |
| Number of rows            | 11                     |                      |
| Coverage per row          | 11.25 ft <sup>2</sup>  | 1.05 m <sup>2</sup>  |
| Linear coverage per row   | Depth 15.87 lin. ft    | 4.84 lin. m          |
|                           | Length 31.74 lin. ft   | 9.68 lin. m          |

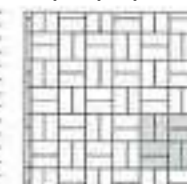


| Unit dimensions | in    | mm  | Units/pallet               |
|-----------------|-------|-----|----------------------------|
| Height          | 2 3/8 | 60  | 495 units                  |
| Depth           | 4 1/4 | 108 | 4 units/ft <sup>2</sup>    |
| Length          | 8 1/2 | 216 | 43.10 units/m <sup>2</sup> |

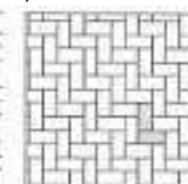
01 | Linear pattern



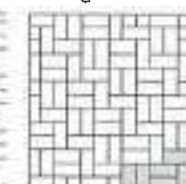
02 | Parquet pattern



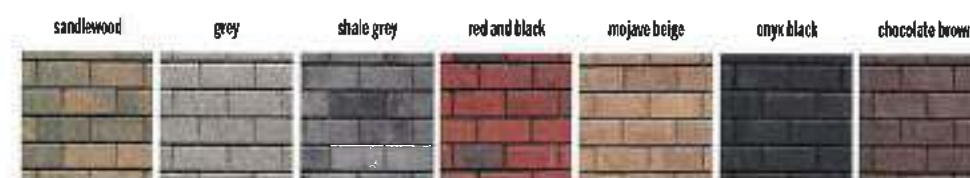
03 | Herringbone pattern



04 | Modified Herringbone



Patterns are for design inspiration only. The installer is responsible to calculate & purchase the correct amount of material.





## TECHO-BLOC WARRANTY

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**TECHO-BLOC IS PROUD TO CERTIFY** that our paving stones and retaining walls meet the latest industry standards in Canada and the United States of America. All Techo-Bloc manufactured landscape products comply with and surpass all applicable standards established by the CSA (*Canadian Standards Association*), ASTM (*American Society for Testing and Materials*) and the BNQ (*Bureau de normalisation du Québec*), recognized as the strictest standards throughout the world.

**TECHO-BLOC OFFERS A TRANSFERABLE LIFETIME WARRANTY** on the structural integrity of all paving stones and retaining wall stones it manufactures. It covers any disintegration and/or decomposition of the above mentioned products resulting from natural causes and the abnormal deterioration of the surface due to the use of sodium chloride (NaCl) such as de-icing salt.

**IF PRODUCTS PROVE DEFECTIVE**, we will replace these units.

Techo-Bloc's responsibility is limited to its products only and not to the costs related to the installation of those products. Installation of the product constitutes your acceptance of the product as is. Techo-Bloc will honor this transferable lifetime warranty with a proof of purchase such as an invoice or delivery slip.

All conditions of the Techo-Bloc warranty apply to the High Definition collection.



## STONEDGE COLLECTION WARRANTY

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**STONEDGE™ LANDSCAPE AND MASONRY PRODUCTS** are manufactured under the highest standards of quality and workmanship. This warranty is offered to the original Consumer Purchaser (Homeowner), for as long as they own their home. STONEDGE™ warrants that the product is free from defects in material and workmanship, and is in compliance with the specifications of the Canadian Standards Association and the American Standards for testing Materials.

All exclusions concerning color, efflorescence, polymeric haze, construction-born residue, compactor & snow removal equipment apply. Unlike the Techo-Bloc products, Stonedge products are not warranted for the use of sodium chloride (NaCl) such as de-icing salt. We recommend the use of these products in backyards where winter access is limited.

**NOTE:** This warranty does not apply to any breakage, chipping, natural wear or other deterioration that were caused from improper design or installation which does not comply with applicable codes, the ICPI (*Interlocking Concrete Pavement Institute*), NCMA (*National Concrete Masonry Association*) and recognized work procedures. This warranty does not apply to any damage resulting from a natural disaster or from a deliberate and/or negligible act on the part of the purchaser, owner of the building, installer or any third party. For industry information about efflorescence, polymeric haze or information pertaining to installation specifications, please visit [www.icpi.org](http://www.icpi.org) or [www.ncma.org](http://www.ncma.org).

## COLOR

Due to the inherent nature of printed literature and current digital media, Techo-Bloc cannot guarantee specific color matching to printed representations of its color swatches.

Each color option is composed of a variety of darker & lighter tones. Natural ingredients such as granite are present within the recipe to allow for a range in tones, veining and textures from one stone to another. Therefore, color samples shown are approximate representations of our standard colors and actual product colors may vary.

Final color selection should be made at your local dealer from stocked product. Techo-Bloc always recommends immediately verifying the product and color upon reception. If there are any discrepancies, contact your local dealer before continuing your project. Installation of the product constitutes your acceptance of the product as is.

## PROPER COLOR DISTRIBUTION AND LAYING TECHNIQUES

Proper installation enhances the overall color of pavement. Units should be randomly picked from at least two pallets when installing. This creates an attractive and subtle blending of color.

## EFFLORESCENCE

This warranty does not apply to efflorescence. Efflorescence is a natural occurring process in all concrete products which sometimes appears in the form of a white powdery film on the pavement surface. Efflorescence is more perceivable in darker colors such as Onyx Black and Chocolate Brown as there is a higher level of contrast than with other blended colors. It does not, in any way, compromise the functionality or the structural integrity of the product. Although efflorescence cannot be prevented, it will wash off over time or can be cleaned with efflorescence cleaner. Techo-Bloc accepts no responsibility or liability for this condition.

## POLYMERIC HAZE

Polymeric haze from the use of polymeric joint sand may appear on your concrete products if the sand was not removed from the surface of the paver properly. This does not, in any way, affect the integrity of the product or your installation. The hazing will weather away naturally with time and rain. It can be removed with a specialized cleaner; you are advised to contact your contractor or the polymeric sand company used for advice on recommendations. Techo-Bloc accepts no responsibility or liability for this occurrence.

## CONSTRUCTION RESIDUE

A by-product of cutting with a saw is residue-filled water or concrete dust. Residue-filled water or re-hydrated dust can cling to the surface and leave a concrete stain. It is recommended to wash and remove the water or concrete dust from the surface of the pavers before it dries. Construction residue can also happen through soil disturbance or environmental elements. These contaminants should be removed immediately but do not affect the integrity of the product or your installation. Techo-Bloc accepts no responsibility or liability for these occurrences.

## COMPACTOR AND SNOW REMOVAL EQUIPMENT

Pavers with an embossed surface (high and low points) are more susceptible to scuff marks from vibratory plate compactors used in most concrete paver installations. Techo-Bloc recommends the use of a urethane mat between the plate and the paver surface during compacting. Contact your equipment supplier for more information about accessories for this purpose. Also, snow removal equipment should have the proper spacing, bumpers, and rubber blade guards to protect the surface of the pavers. Techo-Bloc is not responsible for damage caused by the misuse of compaction or snow removal equipment, which may leave scuff marks, or burns on pavers.



## TECHNICAL DATA SHEET

**Product name:** VICTORIEN 60 mm PERMEABLE  
**Product type:** Permeable interlocking concrete paver (PICP)

### **Geometric characteristics**

**Dimensions (in.):** height x width x length (Dimensions include the joint)  
2 3/8 x 4 1/4 x 8 1/2 (60 x 108 x 216 mm)

**Joint width:** 3/8 in. (10 mm)

**Approximate weight:** 6.5 lb (2.95 kg)

### **Dimensional tolerances<sup>1</sup>**

Length and width:  $\pm 1/16$  in. (1.6 mm)  
Height:  $\pm 1/8$  in. (3.2 mm)

### **Physical characteristics<sup>1</sup>**

**Compressive strength:** 8000 psi (55 MPa) (min)

### **Freeze-thaw durability**

Loss of mass after 50 cycles: 1 % (max)

**Water absorption:** 5 % (max)

### **Surface Infiltration characteristics**

**Percent of open surface area:** 9.6 %

**Surface Infiltration rate<sup>2</sup>:** 909 in./hr (23 085 mm/hr)

**Runoff Coefficient<sup>3</sup>:** 0.25 (PICP on high infiltration soils)  
0.40 (PICP on low infiltration soils)

### **Americans with Disabilities Act (ADA)**

**Surface slip resistance value<sup>4</sup>:** slip-resistant surface texture

**Surface opening<sup>5</sup>:** Joint openings (3/8") filled with aggregates

### **Notes**

1. Meets and exceeds the requirements of the ASTM C 936 Standard Specification for Solid Concrete Interlocking Paving Units.
2. Surface Infiltration rate measured as per ASTM C 1701.
3. Runoff coefficient values as per ICPI "Permeable Interlocking Concrete Pavements Design Manual, 4<sup>th</sup> edition".
4. Accessible paths shall be slip resistant. The above mentioned product is considered slip resistant and therefore complies with this ADA design guideline.
5. Accessible paths shall not allow the passage of a sphere greater than 1/2 in. (13 mm) in diameter. Pavers joint openings filled with aggregates comply with this ADA design guideline.

*To learn more about the textures and colors for this product, please contact our representatives.*

**CANADA** 5255, rue Albert-Millichamp, Saint-Hubert, QC J3Y 8Z8  
**USA** 852 Pennsylvania Avenue, Pen Argyl, PA 18072  
Telephone: 450 656-2992 / Toll free: 1 877 832-4625  
Fax: 450 656-1983  
[www.techo-bloc.com](http://www.techo-bloc.com)

November 2015



## TECHNICAL DATA SHEET

**Product name:** VICTORIEN 60 mm

**Product type:** Precast concrete paver

### Geometric characteristics

**Dimensions (in.):** height x width x length (Dimensions include the joint spacer)

2 3/8 x 4 1/4 x 8 1/2 (60 x 108 x 216 mm)

**Joint width:** 1/8 in. (2.5 mm)

**Approximate weight:**

Victorien 60 mm: 6.8 lbs (3.08 kg)

### Dimensional tolerances<sup>1</sup>

Length and width:  $\pm 1/16$  in. (1.6 mm)

Height:  $\pm 1/8$  in. (3.2 mm)

### Physical characteristics<sup>1</sup>

**Compressive strength:** 8000 psi (55 MPa) (min)

**Freeze-thaw durability**

Loss of mass after 50 cycles: 1 % (max)

**Water absorption:** 5 % (max)

### Americans with Disabilities Act (ADA)

**Surface slip resistance<sup>2</sup>:** slip-resistant surface texture

**Surface opening<sup>3</sup>:** joint opening size, 1/8 in. (2.5 mm)

### Notes

1. Meets and exceeds the requirements of the ASTM C 936 Standard Specification for Solid Concrete Interlocking Paving Units.
2. Accessible paths shall be slip resistant. The above mentioned product is considered slip resistant and therefore complies with this ADA design guideline.
3. Accessible paths shall not allow the passage of a sphere greater than 1/2 in. (13 mm) in diameter. Pavers joint openings filled with joint filler material comply with this ADA design guideline.

*To learn more about the textures and colors for this product, please contact our representatives.*

# PERMEABLE PAVERS

DRIVEWAYS, PERMEABLE DRIVEWAYS & PATIOS



## PHYSICAL AND GEOMETRICAL CHARACTERISTICS - PAVERS






| CHARACTERISTICS                                  | CSA A231.2   | TECHO-BLOC   |
|--|--|--|
| Compressive strength                             | 50 MPa [7200 psi] min.   | 50 MPa [7200 psi] min.   |
| Absorption                                       | -  | 5 % max.   |
| Freeze-thaw durability with use of de-icing salt | Mass loss (max.):<br>225 g/m <sup>2</sup> at 28 cycles<br>500 g/m <sup>2</sup> at 49 cycles    | Mass loss (max.):<br>225 g/m <sup>2</sup> at 28 cycles<br>500 g/m <sup>2</sup> at 49 cycles    |
| Dimensional tolerance                            | Length and Width: -1.0 mm [0.039 in.] to +2.0 mm [0.079 in.]<br>Thickness: ±3.0 mm [0.118 in.] | Length and Width: -1.0 mm [0.039 in.] to +2.0 mm [0.079 in.]<br>Thickness: ±3.0 mm [0.118 in.] |

Notes : Dimensional tolerances prior to the application of architectural finishes.



# Installation guide

## TYPICAL APPLICATION USAGE

| SECTOR  | TRAFFIC TYPE & APPLICATIONS  | PERMEABLE PAVERS  |
|---|--|---|
| RESIDENTIAL                                       |  <p><b>1. Light traffic</b><br/>Cars and occasional light service trucks (ex. residential driveways)</p>  | <ul style="list-style-type: none"> <li>- Antika</li> <li>- Blu 80 mm</li> <li>- Inflo</li> <li>- Mista Random</li> <li>- Pure</li> <li>- Valet</li> <li>- Victorien 60 mm permeable</li> <li>- Villagio</li> </ul>                      |
|   |  <p><b>2. Pedestrian</b><br/>Pedestrian only and at all times (ex. patios)</p>   | <ul style="list-style-type: none"> <li>- Antika</li> <li>- Blu 80 mm</li> <li>- Blu 60 mm</li> <li>- Inflo</li> <li>- Mista Random</li> <li>- Pure</li> <li>- Valet</li> <li>- Victorien 60 mm permeable</li> <li>- Villagio</li> </ul> |
| ICI<br>(Industrial, Commercial and Institutional) |  <p><b>3. Road traffic</b><br/>Cars, heavy trucks, buses (ex. boulevards, main or secondary streets, pedestrian crossings, industrial, ports and airport areas)</p> | <ul style="list-style-type: none"> <li>- Inflo</li> </ul>   |
|   |  <p><b>4. Light traffic</b><br/>Cars and occasional light service trucks (ex. parking lots, sidewalks)</p>  | <ul style="list-style-type: none"> <li>- Inflo</li> <li>- Pure</li> </ul>   |
|   |  <p><b>5. Pedestrian</b><br/>Pedestrian only and at all times, without cars, or trucks or other mobile equipment (ex. terraces, parks, pedestrian walkways)</p>     | <ul style="list-style-type: none"> <li>- Inflo</li> <li>- Pure</li> </ul>   |

# Installation guide

## INFILTRATION CHART

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|--|--------------------------------|-------------------------------|---------------------------------------|
| ANTIKA <sup>2</sup>                    | Variable                       | Variable                      | 993 in./hr (25 227 mm/hr)             |
| BLU 80 mm <sup>2</sup>                 | 3.0                            | 9/32" (7 mm)                  | 570 in./hr (14 475 mm/hr)             |
| INFLO <sup>1</sup>                     | 5.8                            | 1/2" (13 mm)                  | 837 in./hr (21 267 mm/hr)             |
| MISTA RANDOM <sup>1</sup>              | 6.3                            | 3/16" (4 mm) to 9/16" (14 mm) | 610 in./hr (15 505 mm/hr)             |
| PURE <sup>2</sup>                      | 5.0                            | 3/8" (10 mm)                  | 726 in./hr (18 440 mm/hr)             |
| VALET                                  | 5.9                            | 9/32" (7 mm)                  | to come                               |
| VICTORIEN 60 mm PERMEABLE <sup>1</sup> | 9.6                            | 3/8" (10 mm)                  | 909 in./hr (23 085 mm/hr)             |
| VILLAGIO <sup>1</sup>                  | 8.0                            | 3/8" (9 mm) to 9/16" (15 mm)  | 896 in./hr (22 750 mm/hr)             |
| PERMEABLE SLAB                         | PERCENT OF SURFACE OPENING (%) | JOINT WIDTH (mm)              | INFILTRATION RATE <sup>1</sup> (mm/h) |
| BLU 60 mm <sup>2</sup>                 | 3.0                            | 9/32" (7 mm)                  | 570 in./hr (14 475 mm/hr)             |

<sup>1</sup> Measurements were taken at various sites in conformity to the standard ASTM C 1701-09.

<sup>2</sup> Measurements were taken at various sites in conformity to the standard ASTM C 1781.

## OTHER PERMEABLE POSSIBILITIES



Blu 60 mm  
SLAB

(page 28 to 33)



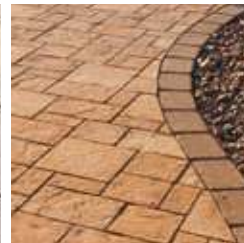
Antika  
PAVER

(page 53)



Blu 80 mm  
PAVER

(page 54 to 58)



Mista Random  
PAVER

(page 72)



Valet  
PAVER

(page 81)

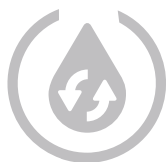


Villagio  
PAVER

(page 83)

# Installation guide

## SEGMENTAL PERMEABLE PAVEMENT



### INSTALLATION OUTLINE

#### 01 DATA COLLECTION

- A. Determine the size, shape, and intended use of finished areas (i.e. residential driveway, secondary commercial parking, etc.).
- B. Classify sub-grade soils.
- C. Document all existing conditions (i.e. fixed points, existing grades, site contours, etc.).
- D. Document soil type, location, and elevation of below grade and overhead utilities both public and private.
- E. Ensure public utilities are marked through the use of a locating service.
- F. Determine the cross section design of the system based on soil type and application, showing proposed sub-grade and finished grade elevations and all geotextiles and drainage pipes needed for the construction.
- G. Establish the type, location, and elevation of relief structures if required (i.e. overflow pipe discharging to rain garden, etc.).
- H. Determine the curb or edge restraint type, elevation, and location.
- I. Choose a pattern appropriate to the application (traffic type and load).

#### 02 EXCAVATION

- A. Before digging, contact the concerned companies if wires or pipes are located in the area to be excavated.
- B. Excavation depth is determined from the foundation thickness according to the project specifications (foundation thickness is determined by a qualified engineer based on structural and hydrological analyses).
- C. Although the slope of the sub-grade will depend on the drainage design and infiltration type, a minimum slope of 0.5% ( $\frac{1}{16}$ " per ft, or 5 mm per meter) is recommended.
- D. The distance that the excavated area should extend beyond the area to be paved should be one to 1.5 times the thickness of the foundation. This extra space will ensure the stability of the pavers near the edge and the edge restraints.
- E. Level the bottom of the excavated area with a rake.

Compaction will reduce the permeability of the sub-grade and it should be executed according to the project specifications. If compaction is not specified, care should be taken to maintain undisturbed soil infiltration during excavation and construction. Stabilization of the sub-grade may be required with weak, continually saturated soils, or when subject to high traffic conditions. If the compaction or stabilization of sub-grade is necessary, reduced infiltration may require drainage pipes within the sub-base to conform to storm water drainage requirements.

#### 03 GEOTEXTILE, IMPERMEABLE LINERS, AND DRAIN PIPES

- A. Use the geotextile specified and install it according to project specifications. The use of a woven geotextile with bi-axel strength that meets design criteria is recommended.
- B. Place the geotextile on the bottom and sides of the soil sub-grade. Eliminate wrinkles in the geotextile and ensure it is not damaged during construction.
- C. Overlap of geotextile should be a minimum of 2' (600 mm) in the direction of drainage. Overlapping should be "shingle" style with respect to any slope direction and base stone distribution direction. Keep properly tensioned, eliminate wrinkles, and avoid damaging fabric (no spikes).
- D. If impermeable liners are required, install them according to project specifications and manufacturer's instructions. Impermeable liners are used when full exfiltration from the reservoir (sub-base and base) into the underlying sub grade is not allowed (no infiltration design). Perforated drainage pipes are usually required in no infiltration and partial infiltration designs.
- E. If drainage pipes are required, install them according to project specifications. The aggregate cover over drainage pipes should be at least 12" (300 mm) to protect them from damage during sub-base or base compaction.

# Installation guide

## SEGMENTAL PERMEABLE PAVEMENT

### 04 SUB-BASE

For residential pedestrian applications, the sub-base may not be required and then only ASTM No. 57 (CSA 5-28) aggregate base layer with a minimum thickness of 6" (150 mm) can be used (use a thicker base for additional water storage). Refer to Base (see below 06).

When traffic load, soil conditions, and climate require greater than 12" (300 mm) of base or volume requirements for detention are higher, a sub-base may be required. Use sub-base ASTM No. 2 or No. 3 (CSA 40-80) meeting the following requirements:

- 90% fractured symmetrical particles
  - Less than 5% passing the 200 sieve
  - Industry hardness tested
- A. Moisten, spread and compact the ASTM No. 2 (CSA 40-80) aggregate sub-base in minimum 6" (150 mm) lifts (without distorting or damaging the geotextile) according to the project specifications.
  - B. Make at least two passes in the vibratory mode followed by at least two passes in the static mode with a minimum 10 ton (9 metric ton) vibratory roller, until there is no visible movement of the aggregate. Alternately, a 13,500 lbf (60 kN) plate compactor can be used to compact the ASTM No. 2 (CSA 40-80) aggregate sub-base.
  - C. Do not allow the compactor to crush the aggregate.
  - D. Surface tolerance of the ASTM No. 2 (CSA 40-80) sub-base should be ffl 2 1/2" (64 mm) over 10' (3 m).

### 05 EDGE RESTRAINT

- A. Install edge restraint according to project specifications.
- B. Depending on the design, the top of the edge restraint can be hidden or exposed.
- C. Install Avignon, Belgik, Pietra, Tundra or Universal edge units. Cast-in-place concrete or precast concrete curbs should be considered in vehicular use applications (commercial / industrial driveways, parking lots or streets).
- D. Edge restraint may rest on an open-graded or dense-graded aggregate base.

### 06 BASE

- A. Moisten, spread and compact the ASTM No. 57 (CSA 5-28) aggregate base layer in one 4" (100 mm) thick lift.
- B. Make a minimum of two passes in vibratory mode followed by at least two in static mode with a minimum 10 ton (9 metric ton) vibratory roller, until there is no visible movement of the aggregate. Alternately, a 13,500 lbf (60 kN) plate compactor can be used to compact the ASTM No. 57 (CSA 5-28) aggregate base.
- C. Do not allow the compactor to crush the aggregate.
- D. Surface tolerance of the ASTM No. 57 (CSA 5-28) base should be ffl 1" (25 mm) over 10' (3 m). Verify prior to setting bed installation.

### 07 BEDDING COURSE

- A. Moisten, spread and screed the ASTM No. 8 (CSA 2.5-10) aggregate bedding layer in one 2" (50 mm) thick lift.
- B. Surface tolerance of the ASTM No. 8 (CSA 2.5-10) bedding course should be ffl 3/8" (10 mm) over 10' (3 m).
- C. Construction equipment and pedestrian traffic on the screeded bedding course should not be permitted.

### 08 PAVER

- A. Pavers should be placed in the pattern shown on the drawings. Lay units hand tight to designated laying patterns. Units have lugs to maintain consistent joint width.
- B. In sloped conditions, it is preferable to start laying from the bottom in an uphill direction.
- C. The minimum slope recommended for permeable pavement surface is 1%.
- D. Inlo pavers can be installed with the TB100SI (Techo-Bloc mechanical tool) to expedite installation.
- E. When subject to vehicular traffic, cut units should not be smaller than 1/3 of a whole paver. When using cut pieces, maintain joint.
- F. In vehicular applications, pattern strength will increase if laying pattern is perpendicular to traffic flow.

# Installation guide

## SEGMENTAL PERMEABLE PAVEMENT

### 09 JOINT FILL

- A. Fill the paver joint openings with ASTM No. 8 (CSA 2.5-10) aggregate (or No. 89, No. 9 depending on joint width). Sweep stone to fill joints. Surface must be swept clean prior to compaction.
- B. Compact with a minimum 5,000 lbf (22 kN) plate compactor (two passes minimum). The installation of a neoprene pad is recommended to protect the texture of the paving units.
- C. Do not compact within 6' (1.8 m) of unrestrained edges of the pavers.
- D. Apply additional aggregate to fill the joint openings if needed and compact.
- E. Surface tolerance of compacted pavers should be ffl  $\frac{3}{8}$ " (10 mm) over 10' (3 m).

### APPROXIMATE MEASURES

Clean stone quantity in kg (lb) to cover an area of 1 m<sup>2</sup> (1 pi<sup>2</sup>) to fill between joints.

*It is recommended to always start with a small area.*

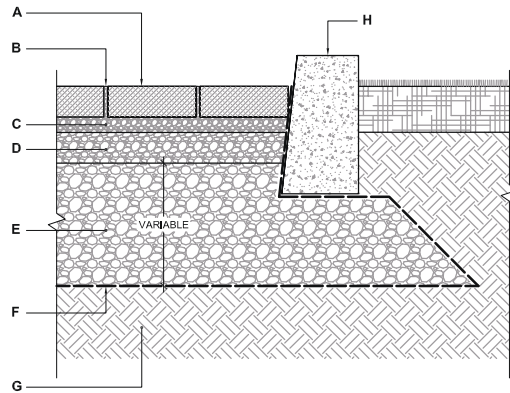
| PRODUCTS                  | JOINT FILL MATERIAL                           | (lbs/sq. ft) | (kg/sq. m) |
|---------------------------|---|--------------|------------|
| Antika                    | ASTM No. 8 (CSA 2.5 - 10) ( $\frac{1}{4}$ " ) | 1.9          | 9.3        |
| Blu 60 mm                 | ASTM No. 9 (CSA 2.5 - 5) ( $\frac{1}{8}$ " )  | 0.6          | 3.0        |
| Blu 80 mm                 | ASTM No. 9 (CSA 2.5 - 5) ( $\frac{1}{8}$ " )  | 0.8          | 4.0        |
| Inflo                     | ASTM No. 8 (CSA 2.5 - 10) ( $\frac{1}{4}$ " ) | 2.1          | 10.3       |
| Mista random              | ASTM No. 9 (CSA 2.5 - 5) ( $\frac{1}{8}$ " )  | 1.0          | 5.0        |
| Pure                      | ASTM No. 9 (CSA 2.5 - 5) ( $\frac{1}{8}$ " )  | 1.4          | 7.0        |
| Valet                     | ASTM No. 9 (CSA 2.5 - 5) ( $\frac{1}{8}$ " )  | 1.3          | 6.2        |
| Victorien 60 mm permeable | ASTM No. 9 (CSA 2.5 - 5) ( $\frac{1}{8}$ " )  | 1.7          | 8.5        |
| Villagio                  | ASTM No. 8 (CSA 2.5 - 10) ( $\frac{1}{4}$ " ) | 2.1          | 10.2       |

### 10 POST INSTALLATION PROTECTION

Prevent contamination of the porous (permeable) pavement system from fine aggregates and debris by maintaining erosion and sedimentation (E&S) measures at the perimeter.

# Installation guide

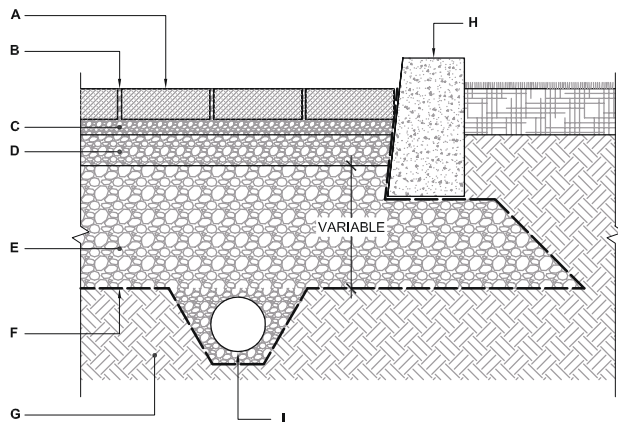
## SEGMENTAL PERMEABLE PAVEMENT



- A. PERMEABLE PAVER FROM TECO-BLOC
- B. JOINT FILLING MATERIAL  
ASTM No 8 (CSA 2.5-10 mm) AGGREGATE
- C. BEDDING COURSE 1½" to 2" (40 to 50 mm)  
ASTM No 8 (CSA 2.5-10 mm) AGGREGATE
- D. BASE COURSE 4" (100 mm)  
ASTM No 57 (CSA 5-28 mm) AGGREGATE
- E. SUBBASE COURSE  
ASTM No 2 (CSA 40-80 mm) AGGREGATE
- F. GEOTEXTILE
- G. SUBGRADE
- H. CONCRETE EDGE

### SEGMENTAL PERMEABLE PAVEMENT – FULL INFILTRATION

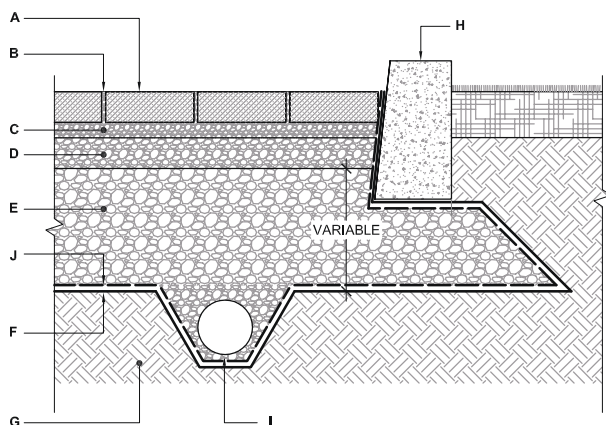
Typical cross section



- A. PERMEABLE PAVER FROM TECO-BLOC
- B. JOINT FILLING MATERIAL  
ASTM No 8 (CSA 2.5-10 mm) AGGREGATE
- C. BEDDING COURSE 1½" to 2" (40 to 50 mm)  
ASTM No 8 (CSA 2.5-10 mm) AGGREGATE
- D. BASE COURSE 4" (100 mm)  
ASTM No 57 (CSA 5-28 mm) AGGREGATE
- E. SUBBASE COURSE  
ASTM No 2 (CSA 40-80 mm) AGGREGATE
- F. GEOTEXTILE
- G. SUBGRADE
- H. CONCRETE EDGE
- I. PERFORATED DRAIN CONNECTED TO DRAINAGE SYSTEM

### SEGMENTAL PERMEABLE PAVEMENT – PARTIAL INFILTRATION

Typical cross section



- A. PERMEABLE PAVER FROM TECO-BLOC
- B. JOINT FILLING MATERIAL  
ASTM No 8 (CSA 2.5-10 mm) AGGREGATE
- C. BEDDING COURSE 1½" to 2" (40 to 50 mm)  
ASTM No 8 (CSA 2.5-10 mm) AGGREGATE
- D. BASE COURSE 4" (100 mm)  
ASTM No 57 (CSA 5-28 mm) AGGREGATE
- E. SUBBASE COURSE  
ASTM No 2 (CSA 40-80 mm) AGGREGATE
- F. IMPERMEABLE MEMBRANE
- G. SUBGRADE
- H. CONCRETE EDGE
- I. PERFORATED DRAIN CONNECTED TO DRAINAGE SYSTEM

### SEGMENTAL PERMEABLE PAVEMENT – NO INFILTRATION

Typical cross section



## **Unilock Concrete Pavers:**

### **From Michael Vargason:**

For all pavers, we want a dense finish. Washed, Tumbled, or Brushed finish might encourage salt to enter the paver and start to break it down.

Unilock's Eco-Piroria in Granite Blend, Winter Marvel, & Midnight Sky all look like they have a good range of gray shades. Standard, Umbriano, or ENDURACOLOR finishes only. The Ecoline looks like it only comes in a random bundle mix of sizes? We don't want that. If we can get just the 9.375 X 4.5 paver, though, that might work.

**Our design team's consensus via emails was that the Unilock Eco Piroria is the best route.**

### **Product Rep Direct Responses to Jeff Questions:**

#### **1.) What is the warranty and what does it cover?**

Unilock does not have a set commercial warranty on our pavers, however residentially our pavers carry a lifetime guarantee on the structural integrity. Commercially these pavers are made with the same mix design, and standards, and often times far surpass industry standards and guidelines. There are tremendous amount of variables and factors with commercial installations that limit us, such as construction vehicles and other trades working over the pavers before the entire system is installed. Is the owner looking for something particular?

#### **2.) Do you recommend sealing the pavers?**

Pavers can be sealed, but do not necessarily need to be sealed. There are a number of different sealers out there that offer a variety of features / benefits. They can be used to help enhance colors, give wet look appearances, and protect the surface of the pavers and some provide a stain resistance. Sealers have a different levels of looks, from semi-gloss, high gloss, natural, & matte finishes. There is even an invisible sealer out there where one would not know the pavers were sealed until the surface is wet and water beads off of the surface. It would be important to note that sealing would provide a certain amount of maintenance that the city would need to re-apply the sealer every few years depending on traffic to ensure a consistent look depending on the wear. Sealing the pavers can help to prolong the look and texture of a paver from wearing. Umbriano does not need to be sealed as it is the Enduracolor manufacturing and has Easy Clean.

#### **3.) Concrete mix design for pavers?**

Unilock manufactures paving stones that meet and exceed Industry standards. They are manufactured of a series of a variety Aggregates, Cement, and Iron Oxide Pigments.

#### **ASTM Standard C140**

#### **CSA Standard A231.2**

- 8000 psi avg.
- 7200 psi min. unit
- 5% absorption avg.
- 7% absorption max.
- Height Tolerance less than +/- 1/8"

Unilock exceeds the industry standards, and our minimums are:

**UNILOCK® Standards**

- **8500** psi min.
- **4%** absorption avg.
- **5%** absorption max.
- Dimensional Accuracy **+/- 3/64"**

I would double check the clay pavers tolerances, PSI, and absorption rates, as these tend to not be as tight of tolerances.

4.) Any test results for pavers showing resistance to de-icing both chloride and non-chloride?

I have attached test results for Freeze Thaw and Saline, I am checking to see if we have any chloride testing.

There are also different levels of Concrete pavers, from Standard Through Mix, to Enduracolor and Enduracolor plus products. Enduracolor plus products hold up the best to de-icing agents. In the video link below is known as the torture test. This is an enduracolor plus product and standard finish in a muriatic acid bath for 5 minutes. The Enduracolor plus product comes out looking essentially the same, while the standard finish is starting to expose its aggregates. This would be comparable to how concrete pavers would hold up after years of deicing agents and rain exposed to them.

<https://youtu.be/hVIJVB9ARg>

5.) Projects sites where they have held up to conditions similar to Burlington over a long period?

We have installations all throughout New England that have been installed for years and are holding up quite well.

University of Massachusetts at Amherst Commonwealth College, This is about 30,000 square feet of Eco Pavers 5x10's.

The Town of Sprague, Connecticut, has a series of roadways completely paved with Permeable pavers.

Rhode Island Public Transit Authority in, Providence, Rhode Island, has over an acre of Eco Optiloc that takes bus traffic and heavy loading daily.

All of these projects have been installed for years and have gone through several winters now.

We have done a series of non-permeable installations as well that I could forward along, such as Jiminy Peak, and many of the ski mountains in Vermont as well.

Jeff Hodgson also asked the following question about Unilock products regarding the Montpelier Transit Center they're currently working on:

- I am back to working on the final specifications for the Montpelier Transit Center. Because this project receives federal funding we have to specify 3 products for

everything. Therefore I want to be careful and not price Unilock Pavers out of the running. We have 2 paver types:

- Vehicular / Pedestrian Permeable: I currently have the Ecoline, Random Bundle, Smooth Finish.
- Vehicular / Pedestrian non-permeable: I currently have the Promenade Plank Paver in Smooth finish specified in a herring bone pattern.
- Of course after our discussions on the Burlington Streetscape Standards I would like to specify Enduracolor with Umbriano finish but I imagine that there is a large premium for that?

6.) Project owner references?

I don't have any direct contacts at the permeable installations referenced, but I can reach out and try to get a current contact. I am sure the town could reach out to the owner of Jiminy Peak, as they are doing more work with pavers.

7.) Will Unilock pavers with the special finishes ever run the risk of the finishing layer peeling off?

Unilock's architectural finishes and enduracolor / enduracolor plus offerings are a state of the art manufacturing process, and both the base layer and finish are all done at one manufacturing process. Thankfully, due to our manufacturing standards and processes, de-lamination on our enduracolor and enduracolor plus products is extremely rare, almost never seen.

Please reference the link below to reference the Enduracolor and Enduracolor plus advantages.

<https://commercial.unilock.com/superior-manufacturing-technology/>

8.) Any best practices that Unilock recommends for maintaining concrete pavers?

I have attached our deicing guidelines, that notes the preferred method would be sodium chloride, followed then by calcium chloride. Magnesium should not be used on concrete pavers. Also for snow removal, if a plow is being used, it should have a neoprene blade, or if it is metal it should be slightly raised. One advantage to permeable pavements is that once the initial snow removal has been completed permeable pavers tend not to have residual icing on the surfaces as all the air circulating under the pavers as well as the open graded joints

9. Cost questions about certain finishes in response to Jeff's question about the Montpelier Transit Center above.

Eric is correct there would be a higher product cost associated with Umbriano finish or enduracolor plus finish, compared to a standard finish or Enduracolor finish (what is currently being looked at). Lifecycle and longevity could be presented to the owner over straight product cost. Umbriano also has what is known as EasyClean, and is almost like a sealer built into the mix design of the paver. This makes the pavers easier to clean, if oils or spills occur, the paver can be cleaned significantly easier than a through mix product.

To circle back to the other finish options mentioned this morning, actually Senzo would most likely come in at a little higher cost than Umbriano, part of that is shipping, as it is manufactured at one of our plants in Canada. The Il Campo is actually only an enduracolor product, while still a nice finish, and holds up well, but does wear slightly different than an Enduracolor Plus

product. Another option that holds up quite well and is slightly less than Umbriano could be the Series 3000 (Exposed Aggregate) finish.

I would think it might be good to specify other pavers with other finishes, and not just standard through mix finish. It would be important to call certain language for each paver, includes sizes, textures, and features. If Umbriano is ultimately picked I would think it would be good for the other manufacturers to provide a sealer that needs to be applied after installation to make cleaning easier.

**File: L17-0267PT**

**Unilock New York, Inc.  
51 International Blvd.  
Brewster, NY 10509**

**August 17, 2017**

**Attn: Mr. Suede Remington**  
[Suede.Remington@unilock.com](mailto:Suede.Remington@unilock.com)

**Dear Sir;**

***Solid Concrete Interlocking Paving Units***

---

Further to receipt of ten (10) approximately 395 mm by 196 mm by 70 mm in size concrete paving units in our laboratory on July 28, 2017, Davroc Testing Laboratories Inc. is pleased to report the results of our tests.

The samples were identified as follows:

|                           |               |
|---------------------------|---------------|
| <b>Davroc Sample No.:</b> | C1035         |
| <b>Product:</b>           | Umbriano      |
| <b>Type:</b>              | 8 x 16        |
| <b>Colour:</b>            | W M           |
| <b>Date Manufactured:</b> | March 9, 2017 |

**Test Procedures**

As per your request the paving unit samples were tested for compressive strength and absorption in accordance with ASTM Designation C936 "Standard Specification for Solid Concrete Interlocking Paving Units" following ASTM Designation C140 -14 "Standard Test Methods for Sampling and Testing Concrete Masonry Unit and Related Units", Annex A4, "Test Procedure for Concrete Interlocking Paving Units".



**File: L17-0267PT**

**2.**

**Test Results**

The results of our tests are given on the attached table.

**Comments**

The specimens tested meet the ASTM C936 requirements for compressive strength and water absorption.

Should you have any questions, please do not hesitate to contact the undersigned.

**Yours very truly,  
Davroc Testing Laboratories Inc.**



**Kateryna Fiyalko, C.E.T.  
Concrete Laboratory Supervisor**



**Sal Fasullo, C.E.T.  
Vice President**

**Distribution:**

[Phil.Hardy@unilock.com](mailto:Phil.Hardy@unilock.com)

**SF/my**

**17-0267-4PT**



## LABORATORY TESTING OF INTERLOCKING PAVING UNITS

**Project No.:** L17-0267PT  
**Manufacturer:** Unilock New York Inc.  
**Date Manufactured:** March 9, 2017  
**Lab No.:** C1035

**Product:** Umbriano  
**Type:** 8 x 16  
**Colour:** W M  
**Date Tested:** August 14, 2017

| DAVROC/<br>CLIENT<br>SPECIMEN NO. | *DIMENSIONS ON SAWN SPECIMEN |               |                |  |  | *COMPRESSIVE STRENGTH RESULTS<br>ON SAWN SAMPLES                        |                 |  |                                  | *WATER ABSORPTION & DENSITY<br>TEST RESULTS |  |
|-----------------------------------|------------------------------|---------------|----------------|--|--|---|-----------------|--|----------------------------------|---|--|
|                                   | LENGTH<br>(mm)               | WIDTH<br>(mm) | HEIGHT<br>(mm) | HYDRASTONE<br>CAPPED<br>HEIGHT<br>(mm) | HYDRASTONE<br>CAPPING<br>THICKNESS<br>(mm) | CROSS<br>SECTION<br>AREA<br>(mm <sup>2</sup> )                          | ASPECT<br>RATIO | ASPECT<br>RATIO<br>FACTOR              | COMPRESSIVE<br>STRENGTH<br>(MPa) | 24 HOURS WATER<br>ABSORPTION<br>(%)         | DENSITY OVEN<br>DRY (kg/m <sup>3</sup> ) |
| C1035-1                           | -                            | -             | -              | -                                      | -  | -   | -               | -                                      | -                                | 3.9   | 2290                                     |
| C1035-2                           | -                            | -             | -              | -                                      | -  | -   | -               | -                                      | -                                | 4.0   | 2275                                     |
| C1035-3                           | -                            | -             | -              | -                                      | -  | -   | -               | -                                      | -                                | 4.1   | 2290                                     |
| C1035-4                           | -                            | -             | -              | -                                      | -  | -   | -               | -                                      | -                                | 4.1   | 2271                                     |
| C1035-5                           | -                            | -             | -              | -                                      | -  | -   | -               | -                                      | -                                | 4.2   | 2267                                     |
| C1035-6                           | 113.9                        | 113.0         | 68.0           | 69.2                                   | 0.6  | 12870.7   | 0.602           | 0.990                                  | 65.3                             | -   | -  |
| C1035-7                           | 113.7                        | 113.0         | 68.0           | 69.4                                   | 0.7  | 12848.1   | 0.602           | 0.990                                  | 64.3                             | -   | -  |
| C1035-8                           | 113.6                        | 113.3         | 68.5           | 68.5                                   | 0.5  | 12870.9   | 0.605           | 0.992                                  | 66.8                             | -   | -  |
| C1035-9                           | 113.7                        | 113.4         | 68.8           | 70.4                                   | 0.8  | 12893.6   | 0.607           | 0.995                                  | 61.5                             | -   | -  |
| C1035-10                          | 113.8                        | 113.4         | 68.5           | 69.7                                   | 0.6  | 12904.9   | 0.604           | 0.992                                  | 66.0                             | -   | -  |
| Mean                              | 113.7                        | 113.2         | 68.4           | 69.6                                   | 0.6  | 12877.6   | 0.604           | 0.992                                  | 64.8                             | 4.0   | 2279                                     |
| ASTM 936<br>Specifications        | -                            | -             | -              | -                                      | Max. 1.5 mm                                | Specified Min. Average: 55.0 MPa<br>Specified Min. Individual: 50.0 MPa |                 | Max. Average 5 %<br>Max. Individual 7% |                                  | No<br>Limit                                 |  |

**REMARKS:** Unless otherwise noted testing was conducted in accordance with ASTM Designation C936  
 \*Testing was performed in accordance with ASTM C140, unless otherwise noted.

**Distribution:**

**Sal Fasullo, C.E.T.**  
 Vice-President

**August 17, 2017**

# ECO-LINE®

Permeable, heavy duty unit pavers have never been so 'on-trend'. With custom finish and color options and the ability to be mechanically installed, this product is not only beautiful, but cost effective.



## CUSTOM FINISH OPTIONS



UMBRIANO®  
Mottled Finish



SERIES 3000®  
Exposed Aggregate Finish



IL CAMPO®  
Brushed Finish  
Not available in all markets



SMOOTH PREMIER  
Finish

## CUSTOM COLOR OPTIONS\*



## PRODUCT SPECIFICATIONS

SPECIAL ORDER  
RANDOM BUNDLE



|                     |                      |                     |                     |                      |                      |                      |                      |
|---------------------|----------------------|---------------------|---------------------|----------------------|----------------------|----------------------|----------------------|
| 14 x 3 3/16 x 4"    | 12 1/2 x 3 5/16 x 4" | 11 x 3 5/16 x 4"    | 9 3/8 x 3 5/16 x 4" | 14 x 4 1/2 x 4"      | 12 1/2 x 4 1/2 x 4"  | 11 x 4 1/2 x 4"      | 9 3/8 x 4 1/2 x 4"   |
| (35.7 x 8.4 x 10cm) | (31.7 x 8.4 x 10cm)  | (27.7 x 8.4 x 10cm) | (23.7 x 8.4 x 10cm) | (35.7 x 11.4 x 10cm) | (31.7 x 11.4 x 10cm) | (27.7 x 11.4 x 10cm) | (23.7 x 11.4 x 10cm) |

*Eco-Line can be manufactured in a variety of custom colors and textures. Minimum quantities will apply. \* Please contact your Unilock Representative for more details.*

E

Eco-  
vehic



# APPLICATION BY SIZE, BY THICKNESS AND PRODUCT

The aspect ratio of the paver unit (length / height = aspect ratio) directly correlates to the recommended usage. A ratio of 3:1 or less is recommended for Commercial and Heavy-Duty Vehicular applications, 4:1 for Residential and Light-Duty Vehicular applications, and over 5:1 for Pedestrian only. Reference the chart below as a guideline and contact your Unilock Representative for more information.

| Product                     | Product Size | Thickness | Pedestrian | Commercial Pedestrian* | Light-Duty Vehicular | Commercial Vehicular | Heavy-Duty | Permeable |
|-----------------------------|--------------|-----------|------------|------------------------|----------------------|----------------------|------------|-----------|
|                             | 36 x 36      | 10 cm     | ✓          |                        |                      |                      |            |           |
|                             | 18 x 36      | 10 cm     | ✓          |                        |                      |                      |            |           |
|                             | 24 x 24      | 15 cm     | ✓          | ✓                      | ✓                    |                      |            |           |
|                             | 24 x 24      | 10 cm     | ✓          | ✓                      | ✓                    |                      |            |           |
|                             | 24 x 24      | 7 cm      | ✓          |                        |                      |                      |            |           |
|                             | 24 x 24      | 5 cm      | ✓          |                        |                      |                      |            |           |
|                             | 24 x 24      | 4.5 cm    | ✓          |                        |                      |                      |            |           |
|                             | 18 x 24      | 5 cm      | ✓          |                        |                      |                      |            |           |
|                             | 18 x 24      | 4.5 cm    | ✓          |                        |                      |                      |            |           |
|                             | 18 x 18      | 4.5 cm    | ✓          |                        |                      |                      |            |           |
|                             | 16 x 24      | 10 cm     | ✓          |                        | ✓**                  |                      |            |           |
|                             | 12 x 24      | 15 cm     | ✓          | ✓                      | ✓                    | ✓                    |            |           |
|                             | 12 x 24      | 10 cm     | ✓          | ✓                      | ✓**                  |                      |            |           |
|                             | 12 x 24      | 7 cm      | ✓          |                        |                      |                      |            |           |
|                             | 12 x 24      | 5 cm      | ✓          |                        |                      |                      |            |           |
|                             | 12 x 24      | 4.5 cm    | ✓          |                        |                      |                      |            |           |
|                             | 8 x 24       | 15 cm     | ✓          | ✓                      | ✓                    |                      |            |           |
|                             | 8 x 24       | 10 cm     | ✓          | ✓                      | ✓**                  |                      |            |           |
|                             | 6 x 24       | 15 cm     | ✓          | ✓                      | ✓                    | ✓                    |            |           |
|                             | 6 x 24       | 7 cm      | ✓          |                        |                      |                      |            |           |
|                             | 16 x 16      | 10 cm     | ✓          | ✓                      | ✓                    | ✓                    |            |           |
|                             | 16 x 16      | 8 cm      | ✓          | ✓                      | ✓                    |                      |            |           |
|                             | 16 x 16      | 7 cm      | ✓          | ✓                      | ✓                    |                      |            |           |
|                             | 8 x 16       | 10 cm     | ✓          | ✓                      | ✓                    | ✓                    |            |           |
|                             | 8 x 16       | 7 cm      | ✓          | ✓                      | ✓                    |                      |            |           |
|                             | 4 x 16       | 10 cm     | ✓          | ✓                      | ✓                    | ✓                    |            |           |
|                             | 12 x 12      | 10 cm     | ✓          | ✓                      | ✓                    | ✓                    |            |           |
|                             | 12 x 12      | 8 cm      | ✓          | ✓                      | ✓                    |                      |            |           |
|                             | 12 x 12      | 7 cm      | ✓          | ✓                      | ✓                    |                      |            |           |
|                             | 12 x 12      | 4.5 cm    | ✓          |                        |                      |                      |            |           |
|                             | 6 x 12       | 10 cm     | ✓          |                        | ✓                    | ✓                    | ✓          |           |
|                             | 6 x 12       | 8 cm      | ✓          | ✓                      | ✓                    | ✓                    |            |           |
|                             | 6 x 12       | 7 cm      | ✓          | ✓                      | ✓                    |                      |            |           |
|                             | 10 x 10      | 8 cm      | ✓          | ✓                      | ✓                    | ✓                    |            | ✓         |
|                             | 5 x 10       | 8 cm      | ✓          | ✓                      | ✓                    | ✓                    | ✓          | ✓         |
|                             | 8 x 8        | 7 cm      | ✓          | ✓                      | ✓                    | ✓                    |            |           |
|                             | 6 x 8        | 7 cm      | ✓          | ✓                      | ✓                    | ✓                    | ✓          |           |
|                             | 4 x 12       | 10 cm     | ✓          | ✓                      | ✓                    | ✓                    | ✓          |           |
|                             | 4 x 12       | 8 cm      | ✓          | ✓                      | ✓                    | ✓                    |            |           |
|                             | 4 x 12       | 7 cm      | ✓          | ✓                      | ✓                    |                      |            |           |
|                             | 3 x 12       | 10 cm     | ✓          | ✓                      | ✓                    | ✓                    | ✓          | ✓         |
|                             | 6 x 6        | 8 cm      | ✓          | ✓                      | ✓                    | ✓                    |            |           |
|                             | 6 x 6        | 7 cm      | ✓          | ✓                      | ✓                    | ✓                    |            | ✓         |
|                             | 5 x 5        | 8 cm      | ✓          |                        | ✓                    | ✓                    |            | ✓         |
|                             | 4 x 8        | 8 cm      | ✓          | ✓                      | ✓                    | ✓                    | ✓          |           |
|                             | 4 x 8        | 7 cm      | ✓          | ✓                      | ✓                    | ✓                    |            |           |
|                             | 4 x 8        | 6 cm      | ✓          | ✓                      | ✓                    | ✓                    |            |           |
|                             | 4 x 4        | 7 cm      | ✓          | ✓                      | ✓                    | ✓                    |            |           |
|                             | 3 x 6        | 10 cm     | ✓          | ✓                      | ✓                    | ✓                    | ✓          |           |
| Anchorlock                  |              | 8 cm      | ✓          | ✓                      | ✓                    | ✓                    | ✓          |           |
| Artline™                    |              | 7 cm      | ✓          |                        |                      |                      |            |           |
| Artline™                    |              | 10 cm     | ✓          |                        |                      |                      |            |           |
| Avante Ashlar™              |              | 7 cm      | ✓          | ✓                      | ✓                    |                      |            |           |
| Bristol Valley™             |              | 6 cm      | ✓          |                        |                      |                      |            |           |
| Brussels Block              |              | 7 cm      | ✓          | ✓                      | ✓                    |                      |            |           |
| Brussels Dimensional™ Paver |              | 10 cm     | ✓          | ✓                      | ✓                    | ✓                    |            |           |
| City Park Paver™            |              | 7 cm      | ✓          | ✓                      | ✓                    | ✓                    |            | ✓ (8cm)   |
| Copthorne                   |              | 6 cm      | ✓          | ✓                      | ✓                    | ✓                    |            |           |
| Courtstone                  |              | 6 cm      | ✓          | ✓                      | ✓                    | ✓                    |            |           |
| Dura-Mat™                   |              | 10 cm     | ✓          |                        |                      |                      |            | ✓         |
| Eco-Line™                   |              | 10 cm     | ✓          | ✓                      | ✓                    | ✓                    | ✓          | ✓         |
| Eco-Optiloc™                |              | 8 cm      | ✓          | ✓                      | ✓                    | ✓                    | ✓          | ✓         |
| Mattoni                     |              | 7cm       | ✓          | ✓                      | ✓                    | ✓                    |            |           |
| Optiloc                     |              | 8 cm      | ✓          | ✓                      | ✓                    | ✓                    | ✓          |           |
| Richcliff                   |              | 6 cm      | ✓          | ✓                      | ✓                    | ✓                    |            |           |
| Thornbury™                  |              | 7 cm      | ✓          | ✓                      | ✓                    | ✓                    |            | ✓         |
| Town Hall™                  |              | 7 cm      | ✓          | ✓                      | ✓                    | ✓                    |            | ✓         |

# UNILOCK RETAINING WALLS

A great retaining wall should provide an **aesthetic that blends** subtly with the environment and **surrounding architecture**. Segmental retaining walls have been the choice of Landscape Architects, Designers and Engineers who are looking for classic, clean lines and timeless appeal.





# ECO-PRIORA™



This versatile, customizable, permeable unit paver is designed with special spacer bars. The resulting 7mm gap is filled with a clear, fine stone chip that allows the rapid penetration of rainwater into the sub-base and subsoil.



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**COLORS** (Consult your regional Product Data Resource Guide to find locally stocked colors)

## CUSTOM FINISH OPTIONS



UMBRIANO®  
Mottled Finish



SENZO™  
Matte Finish



SERIES 3000®  
Exposed Aggregate Finish



IL CAMPO®  
Brushed Finish



SMOOTH/PREMIER  
Finish

## CUSTOM COLOR OPTIONS\*



Ask your Unilock Representative about locally stocked colors.

## PRODUCT SPECIFICATIONS



10 x 10 x 3 1/8"



5 x 10 x 3 1/8"  
(12 x 24 x 8cm)



5 x 5 x 3 1/8"  
(12 x 12 x 8cm)

Herringbone bundles available for mechanical installation in select markets. Ask your Unilock Representative for more details.



## Unilock® Technical Reference

*Topic: Deicing Chemicals*

### What deicing chemicals does Unilock suggest using?

Preferred: **Sodium Chloride (NaCl)** for temperatures down to +20°F (-7°C). Sodium Chloride is commonly known as rock salt.

Only when necessary: **Calcium Chloride (CaCl<sub>2</sub>)** can be used for temperature ranges from below +20°F (-7°C) to -2°F (-19°C).

### Are there any recommendations for using deicing products?

Follow the directions listed on the deicing product bag. In addition, practice these simple recommendations:

- Use sparingly. Only apply the minimum amount necessary to melt the snow and ice. Over applying the product can still result in damage to concrete.
- Sweep and remove any excess deicing chemical after the ice and snow melts.
- After the winter season, thoroughly wash the paver surface to remove any excess deicing chemical remaining.

### Can other types of deicing products be used?

We do not recommend using any other types of deicing chemicals. This includes:

- Magnesium Chloride (MgCl<sub>2</sub>)
- Calcium Magnesium Acetate (CMA)
- Potassium Chloride (KCl)
- Potassium Acetate (KA)
- Fertilizers containing Ammonium Nitrate and Ammonium Sulfate

### The deicing product isn't Sodium Chloride or Calcium Chloride, but the product label says it's safe for concrete. Can this product be used on concrete pavers?

We recommend against using any products other than Sodium Chloride and Calcium Chloride. Our research has found some of the products listed as safe for concrete were incorrect or false and still caused damage to concrete and concrete pavers.

### Will Sodium Chloride and Calcium Chloride damage plant material?

Yes, if not used sparingly. Using less of these products will reduce damage to plants.

### Other types of deicing chemicals have been used on ready mix concrete sidewalks without damaging the surface. Is this because concrete pavers are not as strong?

Damage may not have occurred because the deicing chemical was applied sparingly or perhaps the damage is not yet visible. All concrete materials are susceptible to damage from deicing chemicals no matter how the concrete product is produced. Generally speaking, concrete pavers are two to three times stronger than pour-in-place ready mix type concrete in terms of pounds per square inch strength and have lower absorption rates.

# ECO-PRIORA™ - AVAILABLE IN LOS ANGELES, CALIFORNIA

## Architectural design with engineered performance.

Available in multiple shapes, this new permeable paver is also produced using face-mix technology that will increase the durability of the product and provide better color retention. Custom colors and finishes are available to offer unlimited design possibilities. Combined with a surface infiltration rate of up to 140 inches per hour, Eco-Priora offers both aesthetics and performance.



HERITAGE BROWN  
(SPECIAL ORDER)



RIVER (SRI 34)  
STANDARD FINISH



SIERRA  
STANDARD FINISH



SIERRA  
ANTIQUED FINISH  
*AVAILABLE IN 5" X 10" ONLY*



RIVER  
ANTIQUED FINISH  
NEW FOR 2016  
*AVAILABLE IN 5" X 10" ONLY*

### Special Order Colors



BEECHWOOD  
STANDARD FINISH  
NOT ENDURACOLOR



COFFEE CREEK  
STANDARD FINISH



COFFEE CREEK  
TUMBLED FINISH  
SPECIAL ORDER



GRANITE BLEND  
STANDARD FINISH



GRANITE BLEND  
TUMBLED FINISH  
SPECIAL ORDER



SIERRA  
TUMBLED  
SPECIAL ORDER



AUTUMN SUNSET  
UMBRIANO FINISH  
SPECIAL ORDER



MIDNIGHT SKY  
UMBRIANO FINISH  
SPECIAL ORDER



SUMMER WHEAT  
UMBRIANO FINISH  
SPECIAL ORDER



WINTER MARVEL  
UMBRIANO FINISH  
SPECIAL ORDER



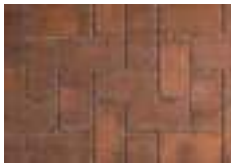
RIVER (SRI 34)  
STANDARD FINISH



HERITAGE BROWN  
IL CAMPO FINISH  
SPECIAL ORDER



SIERRA  
IL CAMPO FINISH  
SPECIAL ORDER



HERITAGE BROWN  
IL CAMPO FINISH



SANTA FE  
IL CAMPO FINISH



OPAL BLEND



STEEL GREY BLEND

Minimum quantities and special pricing may apply. [Contact us](#) for more details.



With so many different options for customization we ask that you [contact](#) your local Unilock Representative for more information about customizing this product.

Minimum quantities will apply.





10 X 10  
24 CM X 24 CM X 8 CM  
9.5" X 9.5" X 3.125"

5 X 10  
24 CM X 12 CM X 8 CM  
9.5" X 4.75" X 3.125"

5 X 10 HERRINGBONE  
SPECIAL ORDER  
24 CM X 12 CM X 8 CM  
9.5" X 4.75" X 3.125"

Special Order Shapes & Sizes



10 X 10  
24 CM X 24 CM X 8 CM  
9.5" X 9.5" X 3.125"

5 X 10  
24 CM X 12 CM X 8 CM  
9.5" X 4.75" X 3.125"

5 X 10  
SPECIAL ORDER  
24 CM X 12 CM X 8 CM  
9.5" X 4.75" X 3.125"

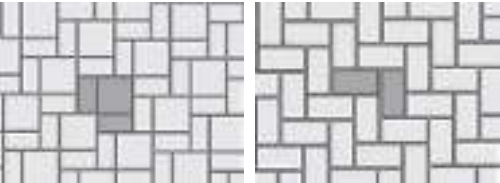
5 X 5  
12 CM X 12 CM X 8 CM  
4.75" X 4.75" X 3.125"

Minimum quantities and special pricing may apply. [Contact us](#) for more details.

|                                     | Unit | Sq. Ft. Thickness | Sq. Ft. Bndl. Layer | Sq. Ft. Stone Bndl. | Layers Bndl. | Ln Ft. Sec. Soldier | Ln Ft. Bndl. Soldier | Sq Ft Ln Ft Soldier | Ln Ft Sec. Sailor | Ln Ft Bndl. Sailor | Sq Ft Ln Ft Sailor | Units Sq. Ft. | Lbs Bndl. | Lbs Sec. Bndl. | Units |
|-------------------------------------|------|-------------------|---------------------|---------------------|--------------|---------------------|----------------------|---------------------|-------------------|--------------------|--------------------|---------------|-----------|----------------|-------|
| 10 x 10                             | 8    | 86.6              | 12.37               | -                   | 7            | -                   | 110.24               | 0.79                | -                 | -                  | 0.79               | 1.61          | 3098.55   | -              | 140   |
| 5 x 10                              | 8    | 74.59             | 10.66               | -                   | 7            | -                   | 96.46                | 0.77                | -                 | -                  | 0.39               | 3.28          | 2668.83   | -              | 245   |
| 5 x 10 Herringbone<br>Special Order | 8    | 74.59             | 10.66               | -                   | 7            | -                   | 98.03                | 0.76                | -                 | -                  | -                  | 3.34          | 2668.83   | -              | 249   |

Special Order - Lead Time Required. Minimum quantities apply. Sold in full bundles only and is shipped on a refundable skid. Eco-Priora™ can be manufactured in a variety of custom colors and textures. Specially graded aggregates must be used for the joints. Contact Unilock for information.

All measurements are nominal.



**Pattern H**  
50% 5x10  
50% 10x10

**Pattern E**  
100% 5x10

Eco-Priora™ River, 34

Permeable

Hybrid Document

View

Download

View

Download

Also available on [CADdetails](#)



32-14-13

## Unilock Permeable 2015

For any additional information or assistance with this spec please contact your Unilock Representative.

**\*\*\* Delete all text in RED after modifying the text in BLUE. All BLUE text requires modification. \*\*\***

## FOREWORD

*These specifications have been prepared for the general guidance of architects, engineers, contractor and superintendents associated with the construction of permeable interlocking concrete pavements. Consult with a qualified engineer to determine the suitability of the design, confirm site conditions and monitor the installation in critical applications.*

## INTRODUCTION

*Unilock® permeable pavers are manufactured in a variety of shapes and colors for residential, commercial, municipal and industrial applications. They offer design professionals several engineered pavement systems that are efficient, durable, economical and aesthetically attractive.*

*Unilock® permeable pavers are manufactured to tight dimensional tolerances. This, in combination with their permeable and interlocking capabilities, allows the surface to be completely porous with a high resistance to compressive loads and lateral forces.*

## SECTION 32 14 13.19

### PERMEABLE CONCRETE PAVER MATERIALS

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Section includes the following:
  - 1. Permeable Concrete Pavers
  - 2. Permeable Joint Opening Aggregate
  - 3. Permeable Joint Aggregate Type 1
  - 4. Permeable Joint Aggregate Type 2
  - 5. Permeable Setting Bed Aggregate (Open-graded)
  - 6. Permeable Base Aggregate (Open-graded)
  - 7. Permeable Subbase Aggregate (Open-graded)

##### 1.02 REFERENCES

Note: Design street, industrial, port and airport pavement thicknesses in consultation with a qualified civil engineer, in accordance with established flexible pavement design procedures, LOCKPAVE® software, and in accordance with Interlocking Concrete Pavement Institute Technical Bulletins. Sample construction detail drawings are available from Unilock®. This specification may require modifications.

- A. ASTM International, latest edition:
  - 1. C 29 Bulk Density and Voids in Aggregate Materials.
  - 2. C 33, Standard Specification for Concrete Aggregates.
  - 3. C 67, Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile, Section 8, Freezing and Thawing.
  - 4. C 136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - 5. C 140, Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
  - 6. C 144 Standard Specifications for Aggregate for Masonry Mortar.
  - 7. D 448, Standard Classification for Sizes of Aggregate for Road and Bridge Construction.
  - 8. C 936, Standard Specification for Solid Concrete Interlocking Paving Units.
  - 9. C 979, Standard Specification for Pigments for Integrally Colored Concrete.

10. D 698 Test Methods for Moisture Density Relations of Soil and Soil Aggregate Mixtures Using a 5.5 lb (24.4 N) Rammer and 12 in. (305 mm) drop.
11. D 1557 Test Methods for Moisture Density Relations of Soil and Soil Aggregate Mixtures Using a 10-lb (44.5 N) Rammer and 18 in. (457 mm) drop.
12. C1645 Standard Test Method for Freeze-thaw and De-icing Salt Durability of Solid Concrete Interlocking Paving Units
13. D 1883, Test Method for California Bearing Ratio of Laboratory-Compacted Soils.
14. D 2940 Graded Aggregate Material for Bases or Subbases for Highways or Airports.
15. D 4254, Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
16. D 5261, Standard Test Method for Measuring Mass per Unit Area of Geotextiles
17. D 4632, Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
18. D 4533, Standard Test Method for Index Trapezoidal Tearing Strength of Geotextiles
19. D 4833, Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes and Related Products
20. D 4491, Standard Test Method for Water Permeability of Geotextiles by Permittivity
21. D 4751, Standard Test Method for Determining Apparent Opening Size of a Geotextile
22. D 4354, Standard Practice for Sampling of Geosynthetics for Testing
23. D 4759, Standard Practice for Determining the Specifications Conformance of Geosynthetics

Delete the BLUE text above if no geotextile is being utilized.

Note: In order to determine the latest version of the listed specifications and standards, please consult the ASTM web page ([www.astm.com](http://www.astm.com))

- B. U.S. Green Building Council Leadership in Energy and Environmental Design (LEED)
1. Building Design + Construction, latest edition

### 1.03 SUBMITTALS

- A. Permeable Concrete Pavers:
1. Samples for verification: Three representative full-size samples of each paver type, thickness, color and finish that indicate the range of color variation and texture expected upon project completion.
  2. Accepted samples become the standard of acceptance for the product produced.
  3. Test results from an independent testing laboratory for compliance of concrete pavers with ASTM C 936.
  4. Manufacturer's catalog product data, installation instructions, and material safety data sheets for the safe handling of the specified materials and products.
- B. Permeable Joint Opening Aggregate:
1. Provide three representative one pound samples in containers of aggregate materials that indicate the range of color variation and texture expected upon project completion.
  2. Accepted samples become the standard of acceptance for the product produced.
  3. Test results from an independent testing laboratory for sieve analysis, including washed gradations per ASTM C 136.
  4. Test results for void space percentage per ASTM C 29.
- C. Permeable Setting Bed, Base and Subbase Aggregate:
1. Test results from an independent testing laboratory for compliance with ASTM D 448 No. 8, No. 57 and No. 2.
  2. Test results from an independent testing laboratory for sieve analysis, including washed gradations per ASTM C 136.
  3. Test results for void space percentage per ASTM C 29.
- D. Paving Installation Contractor:

1. Job references from a minimum of three projects similar in size and complexity. Provide Owner/Client/General Contractor names, postal address, phone, fax, and email address.
  - E. LEED (required only for LEED projects, delete otherwise)
    1. LEED Materials and Resources Credit 4, Recycled Materials: Submit letter from manufacturer certifying the products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content.
      - a. Include statement indicating costs for each product having recycled content.
    2. LEED Materials and Resources Credit 5, Regional Materials: Submit letter from manufacturer certifying products having been extracted, harvested, or recovered, as well as manufactured within 500 miles of the project site.
      - a. Include a statement indicating the percentage by weight which is extracted, harvested, or recovered within 500 miles of the project site.
    3. LEED Sustainable Sites Credit 7.1, Non-roof: Submit letter from manufacturer certifying the solar reflectance index (SRI) of the paver is 29 or greater.
- 1.04 QUALITY ASSURANCE
- A. Utilize a Manufacturer having at least ten years of experience manufacturing interlocking concrete pavers on projects of similar nature or project size.
  - B. Source Limitations:
    1. Obtain Permeable Concrete Pavers from one source location with the resources to provide products of consistent quality in appearance and physical properties.
    2. Obtain Permeable Joint Opening Aggregate from one source with the resources to provide materials and products of consistent quality in appearance and physical properties.
  - C. Paving Contractor Qualifications:
    1. Utilize an installer having successfully completed concrete paver installation similar in design, material, and extent indicated on this project.
  - D. Mockups:
    1. Install a 5 ft x 5 ft paver area.
    2. Use this area to determine joint sizes, lines, laying pattern(s) and levelness. This area will serve as the standard by which the workmanship will be judged.
    3. Subject to acceptance by owner, mock-up may be retained as part of finished work.
    4. If mock-up is not retained, haul offsite and dispose legally.
- 1.05 DELIVERY, STORAGE & HANDLING
- A. In accordance with Conditions of the Contract and Division 1 Product Requirement Section. (Modify this to match the general conditions of the specific project)
  - B. Deliver Permeable Concrete Pavers in manufacturer's original, unopened and undamaged container packaging with identification labels intact.
    1. Coordinate delivery and paving schedule to minimize interference with normal use of streets and sidewalks adjacent to paver installation.
    2. Deliver concrete pavers to the site in steel banded, plastic banded or plastic wrapped packaging capable of transfer by forklift or clamp lift.
    3. Unload pavers at job site in such a manner that no damage occurs to the product or adjacent surfaces.
  - C. Store and protect materials free from mud, dirt and other foreign materials.
- 1.06 PROJECT/SITE CONDITIONS
- A. Environmental Requirements:
    1. Install permeable pavers only on unfrozen permeable setting bed aggregate materials.
    2. Install permeable setting bed only on unfrozen permeable base and subbase aggregates.
    3. Install permeable base or subbase aggregates only over unfrozen subgrade.

**1.07 PERMEABLE CONCRETE PAVER OVERAGE AND ATTIC STOCK**

- A. Provide a minimum of 5% additional material for overage to be used during construction.
- B. Furnish 100 square feet of each product and size used to owner for maintenance and repair. Furnish Permeable Concrete Pavers from the same production run as installed materials.
- C. Manufacture to supply maintenance and reinstatement manuals for Permeable Concrete Paver units.

**1.08 LEED REQUIREMENTS (required only for LEED projects, delete otherwise)**

- A. Add any specific requirements necessary for achieving desired credits.

**PART 2 PRODUCTS****2.01 PERMEABLE CONCRETE PAVERS**

- A. Basis-of-Design Product: The permeable concrete paver shapes are based on:
  - 1. Unilock: (Select product or products being used)
    - a. Eco-Optiloc
    - b. Eco-Priora
    - c. Ecoloc
    - d. Eco-Stone
    - e. Town Hall
  - 2. As manufactured by:
    - Unilock (Add location)
    - Address
    - City, State and Zip
    - Contact: (insert Unilock representative name and phone number) or your local Territory Manager
  - 3. The specified products establish minimum requirements that substitutions must meet to be considered acceptable.
    - a. To obtain acceptance of unspecified products, submit written requests at least 7 days before the Bid Date.

Note: Unless required by the owner, an "or equal" line is not necessary when using a basis-of-design specification with the above information is listed and outline in Division 1, Product Substitution Procedures.

Or choose number 3 below and delete above number 3.

3. Substitutions: No substitutions permitted.

- B. Product requirements:
  - 1. Permeable Paver Type 1: Unilock Eco-Optiloc (or other Unilock product name)
    - a. Color: Insert product color
    - b. Finish: (Select finish type from below and insert here. Finish type will affect product pricing).
      - 1. Standard – this is not a face mix finish.
      - 2. Smooth (Premier) – this is a face mix finish.
      - 3. Brushed (IL Campo) – this is a face mix finish.
      - 4. Exposed Granite (Series 3000) – this is a face mix finish.
      - 5. Granite appearance (Umbriano) – this is a face mix finish.
      - 6. Tile appearance (Belpasso) – this is a face mix finish.
      - 7. TX Active photocatalytic cement – this is a face mix finish.
    - c. Edge: Chamfer - 3 mm bevel
    - d. Size: Manufacture the sizes indicated with a maximum tolerance of plus or minus 1/16 in all directions.
      - 1. L-shape
  - Note: Imperial dimensions are nominal equivalents to the metric dimensions.
  - 2. Permeable Paver Type 2: Unilock Eco-Priora (or other Unilock product name)

- a. Color: Insert product color
- b. Finish: (Select finish type from below and insert here. Finish type will affect product pricing).
  - 1. Standard – this is not a face mix finish.
  - 2. Smooth (Premier) – this is a face mix finish.
  - 3. Brushed (IL Campo) – this is a face mix finish.
  - 4. Exposed Granite (Series 3000) – this is a face mix finish.
  - 5. Granite appearance (Umbriano) – this is a face mix finish.
  - 6. Tile appearance (Belpasso) – this is a face mix finish.
  - 7. TX Active photocatalytic cement – this is a face mix finish either Premier or Brushed.
- c. Edge: Chamfer - 3 mm rolled
- d. Size: Manufacture the sizes indicated with a maximum tolerance of plus or minus 1/16 in all directions.
  - 1. 120 mm (5 in) x 120 mm (5 in) x 80 mm (3-1/8 in) thick
  - 2. 120 mm (5 in) x 240 mm (10 in) x 80 mm (3-1/8 in) thick
  - 3. 240 mm (10 in) x 240 mm (10 in) x 80 mm (3-1/8 in) thick

Note: Imperial dimensions are nominal equivalents to the metric dimensions.
- 3. Permeable Paver Type 3: Town Hall (or other Unilock product name)
  - a. Color: Insert product color(s): Burgundy Red, Burnt Clay, Old Oak
  - b. Finish: Streetpaver appearance
  - d. Size: Manufacture the sizes indicated with a maximum tolerance of plus or minus 1/16 in all directions.
    - 1. 10 cm (4 in) x 25 cm (9-3/4 in) x 7 cm (2-3/4 in) thick
- 4. (Insert additional Permeable Paver Types here as necessary or delete this line)
- C. Provide pavers meeting the minimum material and physical properties set forth in ASTM C 936, Standard Specification for Interlocking Concrete Paving Units. Efflorescence is not a cause for rejection.
  - 1. Average compressive strength 8000 psi (55MPa) with no individual unit under 7,200 psi (50 MPa).
  - 2. Average absorption of 5% with no unit greater than 7% when tested according to ASTM C 140.
  - 3. Resistance to 50 freeze-thaw cycles, when tested according to ASTM C1645, with no breakage greater than 1.0% loss in dry weight of any individual unit. Conduct this test method not more than 12 months prior to delivery of units.

Note: Efflorescence is a whitish powder-like deposit that sometimes appears on concrete products. Calcium hydroxide and other water-soluble materials form or are present during the hydration of Portland cement. Pore water becomes saturated with these materials, and diffuses to the surface of the concrete. When this water evaporates, the soluble materials remain as a whitish deposit on the concrete surface. The calcium hydroxide is converted to calcium carbonate during a reaction with carbon dioxide from the atmosphere. The calcium carbonate is difficult to remove with water. However, the efflorescence will wear off with time, and it is advisable to wait a few months before attempting to remove any efflorescence. Commercially available cleaners can be used, provided directions are carefully followed. Some cleaners contain acids that may alter the color of the pavers.
- D. Accept only pigments in concrete pavers conforming to ASTM C 979.  
Note: ACI Report No. 212.3R provides guidance on the use of pigments.
- E. Maximum allowable breakage of product is 5%.
- F. TX Active is a Portland Cement (white) Type I, II, and III complying with ASTM C 150 with the addition of proprietary particles of titanium dioxide (TiO<sub>2</sub>) specifically engineered for use in the manufacture of concrete and concrete products.
  - 1. TX Active - Self-cleaning and pollution reduction
    - Concrete will resist most organic and inorganic pollutants that gather on the surface causing discoloration.



- Concrete will remove significant amounts of environmental pollutants deemed harmful to human health.
- 2. As manufactured by ESSROC Italcementi Group.
  - a. Unilock Chicago is an authorized producer of TX Active products.

**NOTE: CONTACT YOUR LOCAL UNILOCK COMMERCIAL PRODUCT REPRESENTATIVE PRIOR TO SPECIFYING TX ACTIVE CEMENT.**

## 2.02 PERMEABLE JOINT OPENING AGGREGATE

- A. Provide Permeable Joint Opening Aggregate materials conforming to ASTM C 33 and gradation requirements of ASTM D 448 No. 8 as shown in Table 1. **Unilock recommends using granite chips listed in table 2 below for vehicular areas with heavy traffic loads such as roadways or drive-through areas.**

**TABLE 1 - ECO-OPTILOC  
PERMEABLE JOINT OPENING AGGREGATE  
GRADATION REQUIREMENTS  
(CRUSHED LIMESTONE)**

| ASTM No. 8       |                 |
|------------------|-----------------|
| Sieve Size       | Percent Passing |
| 1/2 in (12.5 mm) | 100             |
| 3/8 in (9.5 mm)  | 85 to 100       |
| No. 4 (4.75 mm)  | 10 to 30        |
| No. 8 (2.36 mm)  | 0 to 10         |
| No. 16 (1.18 mm) | 0 to 5          |

- B. Provide Permeable Joint Opening Aggregate materials conforming to ASTM C 33 and gradation requirements as presented in Table 2.
1. Supplier:
    - a. [Kafka Granite LLC, 101 S. Weber Ave, Stratford, WI 54484 – Toll Free: 800-852-7415](#)
    - b. [Alliance Aqua-Roc](#)
    - c. [SEK Perm Chip](#)
  2. Color: [\(Specify granite chip color if other than crushed limestone\)](#)

**TABLE 2 - ECO-PRIORA & TOWN HALL  
PERMEABLE JOINT OPENING AGGREGATE  
GRADATION REQUIREMENTS  
(GRANITE CHIPS)**

| 1/8 to 3/16 inch granite chips |                 |
|--------------------------------|-----------------|
| Sieve Size                     | Percent Passing |
| 1/4 in (6 mm)                  | 97 to 100       |
| No. 4 (4.75 mm)                | 70 to 83        |
| No. 8 (2.36 mm)                | 37 to 50        |
| No. 16 (1.18 mm)               | 0 to 12         |
| pan                            |                 |

## 2.03 PERMEABLE SETTING BED AGGREGATE

- A. Provide Permeable Setting Bed Aggregate materials conforming to ASTM C 33 and gradation requirements of ASTM D 448 No. 8 as presented in Table 3.

**TABLE 3  
PERMEABLE SETTING BED AGGREGATE  
GRADATION REQUIREMENTS**

| <b>ASTM No. 8</b> |                        |
|-------------------|------------------------|
| <b>Sieve Size</b> | <b>Percent Passing</b> |
| ½ in (12.5 mm)    | 100                    |
| 3/8 in (9.5 mm)   | 85 to 100              |
| No. 4 (4.75 mm)   | 10 to 30               |
| No. 8 (2.36 mm)   | 0 to 10                |
| No. 16 (1.18 mm)  | 0 to 5                 |

**2.04 PERMEABLE BASE AGGREGATE**

- A. Provide Permeable Base Aggregate materials conforming to ASTM C 33 and gradation requirements of ASTM D 448 No. 57 as presented in Table 4.

**TABLE 4  
PERMEABLE BASE AGGREGATE  
GRADATION REQUIREMENTS**

| <b>ASTM No. 57</b> |                        |
|--------------------|------------------------|
| <b>Sieve Size</b>  | <b>Percent Passing</b> |
| 1-1/2 in (37.5 mm) | 100                    |
| 1 in (25 mm)       | 95 to 100              |
| 1/2 in (12.5 mm)   | 25 to 60               |
| No. 4 (4.75 mm)    | 0 to 10                |
| No. 8 (2.36 mm)    | 0 to 5                 |

**2.05 PERMEABLE SUBBASE AGGREGATE**

- A. Provide Permeable Subbase Aggregate materials conforming to ASTM C 33 and gradation requirements of ASTM D 448 No. 2 as presented in Table 5.

**TABLE 5  
PERMEABLE SUBBASE AGGREGATE  
GRADATION REQUIREMENTS**

| <b>ASTM No. 2</b>  |                        |
|--------------------|------------------------|
| <b>Sieve Size</b>  | <b>Percent Passing</b> |
| 3 in (75 mm)       | 100                    |
| 2-1/2 in (63 mm)   | 90 to 100              |
| 2 in (50 mm)       | 35 to 70               |
| 1-1/2 in (37.5 mm) | 0 to 15                |
| 3/4 (19 mm)        | 0 to 5                 |

**Note:** For all aggregates, provide washed, clean, have zero plasticity, free from deleterious or foreign matter, crushed, angular rock and contain no No. 200 sieve size aggregate materials used in the construction of permeable pavement. Aggregate materials serve as the structural load bearing platform of the pavement as well as a temporary receptor for the infiltrated water that is collected through the openings in the pavement's surface.

**2.06 GEOTEXTILE (Optional depending on soil conditions)**

- A. Provide Geotextile material conforming to the following performance characteristics, measured per the test methods referenced:
  - 1. 4 oz., nonwoven needle punched geotextile composed of 100% polypropylene staple fibers that are inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids.
  - 2. Grab Tensile Strength: ASTM D 4632: 115 lbs.
  - 3. Grab Tensile Elongation: ASTM D 4632: 50%
  - 4. Trapezoidal Tear: ASTM D4533: 50 lbs.
  - 5. Puncture: ASTM D4833: 65 lbs.
  - 6. Apparent Opening Size: ASTM D 4751: 0.212 mm, 70 U.S. Sieve
  - 7. Permittivity: ASTM D 4491: 2.0 sec -1
  - 8. Flow Rate: ASTM D 4491: 140 gal/min/s.f.
- B. As supplied by Unilock (add location, address, City, State and Zip)  
 Contact: (Insert Unilock representative name and phone number) or your local Territory Manager
  - 1. Carthage Mills – FX-40HS
  - 2. U.S. Fabrics – US 115NW
  - 3. Mirafi – 140N

**2.07 EDGE RESTRAINTS**

- A. Concrete Edge Restraint as indicated.
- B. Plastic and Metal Edge Restraints:
  - 1. Permaloc, [www.permaloc.com](http://www.permaloc.com)
    - a. Material Type: Aluminum
    - b. Model No.: 3 inch GeoEdge capture plate and geogrid
  - 2. SEK Surebond
    - a. Model No.: 8 feet PermEdge with attached geogrid

**Note:** The provision of suitable edge restraints is critical to the satisfactory performance of interlocking concrete block pavement. Abut pavers tightly against the restraints to prevent rotation under load and any consequent spreading of joints. Install sufficiently stable edge restraints that are, in addition to providing suitable edge support for the paver units, able to withstand the impact of temperature changes, vehicular traffic and/or snow removal equipment.

Curbs, gutters or curbed gutter, constructed to the dimensions of municipal standards (noting that these standards generally refer to cast-in-place concrete sections), are considered to be acceptable edge restraints for heavy duty installations. Where extremely heavy industrial equipment is involved such as container handling equipment, review the flexural strength of the edge restraint carefully particularly if a section that is flush with the surface is used and may be subjected to high point loading.

**2.08 ACCESSORIES (Optional depending on project needs)**

- A. [Cleaners] [Sealers]
  - 1. Supplier: Unilock (add location, address, City, State and Zip)  
 Contact: (Insert Unilock representative name and phone number) or your local Territory Manager
  - 2. Material Type and Description: (Specify material type and description)
  - 3. Material Standard: (Specify material standard)

**Note:** Generally sealing permeable pavers for utilitarian uses such as parking lots is not necessary. Consult with your product representative prior to specifying or remove section 2.08 Accessories.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Examine areas indicated to receive paving for compliance with requirements for installation tolerances and other conditions affecting performance for the following items before placing the Permeable Concrete Pavers.
  - 1. Verify that subgrade preparation, compacted density and elevations conform to specified requirements.
  - 2. Verify that Geotextiles, if applicable, have been placed according to drawings and specifications.
  - 3. Verify that Permeable Base and Subbase Aggregate materials, thickness, compacted density, surface tolerances and elevations conform to specified requirements.
  - 4. Provide written density test results for soil subgrade, Permeable Base and Subbase Aggregate materials to the Owner, General Contractor and paver installation subcontractor.
  - 5. Verify location, type, and elevations of edge restraints, concrete collars around utility structures, and drainage inlets.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
  - 1. Beginning of bedding sand and paver installation signifies acceptance of base and edge restraints.

### 3.02 PREPARATION

- A. Verify that the subgrade soil is free from standing water.
- B. Stockpile Permeable Setting Bed, Joint, Base and Subbase Aggregate materials such that they are free from standing water, uniformly graded, free of any organic material or sediment, debris, and ready for placement.
- C. Remove any excess thickness of soil applied over the excavated soil subgrade to trap sediment from adjacent construction activities before placing the Geotextile and Permeable Subbase Aggregate materials.
- D. Keep area where pavement is to be constructed free from sediment during entire job. Remove and replace all Geotextile, Permeable Joint, Setting Bed, Base and Subbase Aggregate materials contaminated with sediment with clean materials.
- E. Complete all subdrainage of underground services within the pavement area in conjunction with subgrade preparation and before the commencement of Permeable Subbase Aggregate construction.
- F. Prevent damage to underdrain pipes, overflow pipes, observation wells, or inlets and other drainage appurtenances during installation. Report all damage immediately.
- G. Compact soil subgrade uniformly to at least 90 percent of Standard Proctor Density per ASTM D 698 for pedestrian areas. Compact soil subgrade uniformly to at least 95 percent Modified Proctor per ASTM D 1557 for vehicular areas.
- H. Proof-roll prepared subgrade according to requirements in Division 31 Section "Earth Moving" to identify soft pockets and areas of excess yielding. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting and replace with compacted backfill or fill as directed.

**Note:** Base compaction and proof-rolling of the subgrade soil on the recommendations of the Design Engineer. Request the Architect/Engineer to inspect subgrade preparations, elevations and conduct density tests for conformance to specifications.

**Note:** Mechanical tampers (jumping jacks) are recommended for compaction of soil subgrade and aggregate base around lamp standards, utility structures, building edges, curbs, tree wells and other protrusions. Compact areas, not accessible to roller compaction equipment, to the specified density with mechanical tampers. **CAUTION** – Proceed with care around the perimeters of excavations, buildings, curbs, etc. These areas are especially prone to consolidation and settlement. Do not place wedges of backfill in these

areas. If possible particularly in these areas, proceed with backfilling and compacting in shallow lifts, parallel to the finished surface.

### 3.03 INSTALLATION

#### A. EDGE RESTRAINTS

1. Provide edge restraints as indicated.
  - a. Install job-built concrete edge restraints to comply with requirements in Division 3 Section "Cast-in-Place Concrete." (Add section number and match specification name)
  - b. Provide concrete edge restraint along the perimeter of all paving as specified. Install the face of the concrete edge restraint, where it abuts pavers vertical down to the subbase.
  - c. Construct concrete edge restraint to dimensions and level specified and support on a compacted subbase not less than 6 in (150 mm) thick.
2. Provide plastic or metal edge restraints as indicated. (Delete if not being used).
  - a. Provide plastic or metal edge restraints along the perimeter of all paving as indicated and supported on a minimum of 6 inches (150 mm) of Base Aggregate.
  - b. Provide 10" spiral galvanized or stainless steel spike to fasten plastic edge restraint at 24 inches on center for straight sections and 12 inches on center for curved sections.

#### B. GEOTEXTILES (Delete if not being used).

1. Provide separation geotextile on bottom and sides of prepared soil subgrade. Secure in place to prevent wrinkling or folding from equipment tires and tracks.
2. Overlap ends and edges a minimum of 18 in. (450 mm) in the direction of drainage.

#### C. PERMEABLE BASE AND SUBBASE AGGREGATE

1. Provide the Permeable Subbase Aggregate in uniform lifts not exceeding 6 in., (150 mm) loose thickness and compact to at least 95 percent as per ASTM D 4254 to depths as indicated.
2. Compact the Permeable Subbase Aggregate material with at least two passes in the vibratory mode then at least two in the static mode with a minimum 10 ton vibratory roller until there is no visible movement. Do not crush aggregate with the roller.
3. Tolerance: Do not exceed the specified surface grade of the compacted Permeable Subbase Aggregate material more than  $\pm 3/4$  in. (20 mm) over a 10 ft. (3 m) long straightedge laid in any direction.
4. Provide the Permeable Base Aggregate material in uniform lifts not exceeding 6 in. (150 mm) over the compacted Permeable Subbase Aggregate material and compact to at least 95 percent as per ASTM D 4254 to depths as indicated.
5. Compact the Permeable Base Aggregate material with at least two passes in the vibratory mode then at least two in the static mode with a minimum 10 ton vibratory roller until there is no visible movement. Do not crush aggregate with the compaction device.
6. Tolerance: Do not exceed the specified surface grade of the compacted Permeable Base Aggregate material more than  $\pm 1/2$  in. (13 mm) over a 10 ft. (3 m) long straightedge laid in any direction.
7. Grade and compact the upper surface of the Permeable Base Aggregate material sufficiently to prevent infiltration of the Permeable Setting Bed Aggregate material both during construction and throughout its service life.

Note: In-place density of the Permeable Base and Subbase Aggregate materials may be checked per ASTM D 4254. Establish a Compacted density of 95% of the laboratory index density for the subbase and base stone.

#### D. PERMEABLE SETTING BED AGGREGATE

1. Provide and spread Permeable Setting Bed aggregate evenly over the Permeable Base Aggregate course and screed to a nominal thickness of 1-1/2 in. (40 mm).
  - a. Protect screeded Permeable Setting Bed Aggregate from being disturbed.

- b. Screed only the area which can be covered by pavers in one day.
  - c. Do not use Permeable Setting Bed Aggregate material to fill depressions in the base surface.
- 2. Keep moisture content constant and density loose and constant until Concrete Pavers are set and compacted.
- 3. Inspect the Permeable Setting Bed Aggregate course prior to commencing the placement of the permeable concrete pavers.
- 4. Inspect the Setting Bed Aggregate course prior to commencing the placement of the Permeable Concrete Pavers. Acceptance of the Setting Bed Aggregate occurs with the initiation of Permeable Concrete Paver placement.
- E. PERMEABLE CONCRETE PAVERS
  - 1. Replace unit pavers with chips, cracks, voids, discolorations, and other defects that might be visible in finished work.
  - 2. Mix Concrete Pavers from a minimum of three (3) bundles simultaneously drawing the paver vertically rather than horizontally, as they are placed, to produce uniform blend of colors and textures. (Color variation occurs with all concrete products. This phenomenon is influenced by a variety of factors, e.g. moisture content, curing conditions, different aggregates and, most commonly, from different production runs. By installing from a minimum of three (3) bundles simultaneously, variation in color is dispersed and blended throughout the project).
  - 3. Exercise care in handling face mix pavers to prevent surfaces from contacting backs or edges of other units.
  - 4. Provide Permeable Concrete Pavers using joint pattern as indicated. Adjust joint pattern at pavement edges such that cutting of edge pavers is minimized. Cut all pavers exposed to vehicular tires no smaller than one-third of a whole paver.
  - 5. Use string lines or chalk lines on Permeable Setting Bed aggregate to hold all pattern lines true.
  - 6. Set surface elevation of pavers 1/8 in. (3 mm) above adjacent drainage inlets, concrete collars or channels.
  - 7. Place units hand tight against spacer bars. Adjust horizontal placement of laid pavers to align straight.
    - a. When installation is performed with mechanical equipment, use only unit pavers with spacer bars on sides of each unit.
  - 8. Provide space between paver units of 1/32 in. (1 mm) wide to achieve straight bond lines.
  - 9. Prevent joint (bond) lines from shifting more than  $\pm 1/2$  in. ( $\pm 15$  mm) over 50 ft. (15 m) from string lines.
  - 10. Fill gaps between units or at edges of the paved area that exceed 3/8 inch (10 mm) with pieces cut to fit from full-size unit pavers.
  - 11. Cut unit pavers with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable.
  - 12. Prevent all traffic on installed pavers until Permeable Joint Aggregate has been vibrated into joints. Keep skid steer and forklift equipment off newly laid pavers that have not received initial compaction and Permeable Joint Aggregate material.
  - 13. Vibrate pavers into leveling course with a low-amplitude plate vibrator capable of a to 5000-lbf (22-kN) compaction force at 80 to 90 Hz. Perform at least three passes across paving with vibrator. Vibrate under the following conditions:
    - a. After edge pavers are installed and there is a completed surface.
    - b. Compact installed concrete pavers to within 6 feet (1,800 mm) of the laying face before ending each day's work. Cover pavers that have not been compacted and leveling course on which pavers have not been placed, with nonstaining plastic sheets to prevent Permeable Setting Bed Aggregate from becoming disturbed.



14. Protect face mix Concrete Paver surface from scuffing during compaction by utilizing a urethane pad.
15. Remove any cracked or structurally damaged pavers and replace with new units prior to installing Permeable Joint Opening Aggregate material.
16. Provide, spread and sweep Permeable Joint Opening Aggregate into joints immediately after vibrating pavers into Permeable Setting Bed course until full. Vibrate pavers and add Permeable Joint Aggregate material until joints are completely filled, then remove excess material. This will require at least 4 passes with a plate compactor.
17. Remove excess Permeable Joint Aggregate broom clean from surface when installation is complete.

### 3.04 FIELD QUALITY CONTROL

- A. Verify final elevations for conformance to the drawings after sweeping the surface clean.
  1. Prevent final Concrete Paver finished grade elevations from deviating more than  $\pm 3/8$  in. ( $\pm 10$  mm) under a 10 ft (3 m) straightedge or indicated slope, for finished surface of paving.
- B. Lippage: No greater than  $1/32$  in. (0.8 mm) difference in height between Permeable Concrete Pavers and adjacent paved surfaces.

### 3.05 REPAIRING, CLEANING AND SEALING

- A. Remove and replace unit pavers that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Provide new units to match adjoining units and install in same manner as original units, with same joint treatment and with no evidence of replacement.
- B. Cleaning: Remove excess dirt, debris, stains, grit, etc. from exposed paver surfaces; wash and scrub clean.
  1. Clean Permeable Concrete Pavers in accordance with the manufacturer's written recommendations.
- C. Seal as indicated. (If not indicated elsewhere in the contract documents, sealing is not required and remove this section 3.05, C.)
  1. Apply Sealer for Permeable Concrete Pavers in accordance with the sealer and paver manufacturer's written recommendations.

### 3.06 PROTECTION

- A. Protect completed work from damage due to subsequent construction activity on the site.

### 3.07 PERMEABLE JOINT AGGREGATE MATERIAL REFILLING

- A. Remove all debris from joint and provide additional Permeable Joint Aggregate material after 120 days and before 150 days after date of Substantial Completion/Provisional Acceptance.

1. Fill Permeable Joint Aggregate material full to the lip of the paver.

**NOTE: This preventative maintenance requirement is very important to include in your specification to help increase the long term function of the system. This is a good item to mention during the prebid meeting.**

### 3.08 LIFE CYCLE ACTIVITIES

- A. Paver cleaning: Clean Permeable Concrete Pavers as needed to remove staining, dirt, debris, etc.
  1. Clean per manufacturers recommendations.
- B. Maintenance: Permeable Joint Aggregate Material.
  1. Annually inspect Permeable Joint Aggregate material for areas clogged with debris.
  2. Vacuum or sweep as necessary to restore surface infiltration.
  3. Remove debris by vacuuming or sweeping Permeable Joint Aggregate
    - a. Replenish removed Permeable Joint Aggregate material with clean aggregate material flush to paver lip.



- b. Sweep excess material from paver surface.

END OF SECTION

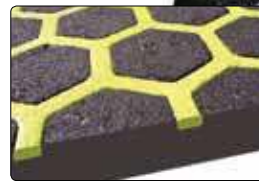
## Inlaid Preformed Thermoplastic Crosswalks and Traffic Calming Surfaces for Asphalt

DuraTherm® is a specially-designed preformed thermoplastic material that is inlaid into an imprinted asphalt surface and thermally bonded using specialized infrared heaters. Engineered to lie slightly below the asphalt surface, DuraTherm® is protected from wear, ensuring effective service life while maintaining its attractive contemporary look for years. Not only do these streetscape enhancements provide aesthetic appeal that communities and property owners desire, safety for shared roadway users is also enhanced and regulatory requirements are not compromised.

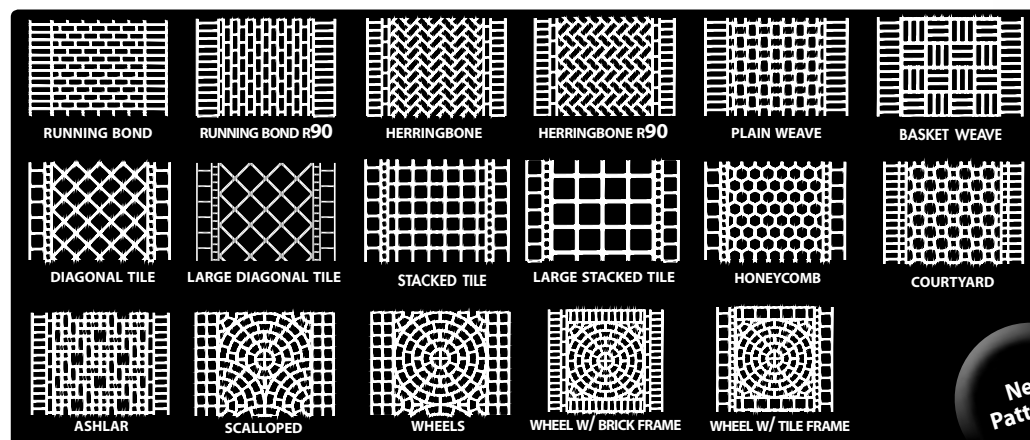
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- Low maintenance
- Design flexibility with standard and customizable colors and patterns
- Eliminates the maintenance and safety concerns of loose pavers
- All preformed thermoplastic materials are made at Ennis-Flint's manufacturing facility which is ISO 9001:2008 certified for design, development and manufacturing of preformed thermoplastic. Quality, value and long-term performance are built into the marking. Anti-skid elements are added at time of manufacturing for optimized application at the jobsite.

DuraTherm® is installed by a network of Certified Applicators so you can be confident that your design intentions will translate to fully-met expectations on the job site. A specialized pavement heater softens the existing asphalt. Templates are pressed into the surface to create the imprinted pattern. Pre-cut sections of DuraTherm® are set into these impressions. The specialized heater is used again to bond the material to the asphalt surface.



### STANDARD PATTERNS Custom patterns are available requiring a minimum purchase.



### STANDARD COLORS



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- Improve traffic safety especially at intersections and multi-use paths
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### INLAID



### IMPRESSED



### INTERCONNECTED



### OVERLAY



### SURFACE SIGNS



When used on public roadways and private properties open to public travel, decorative crosswalks require proper demarcation with white linear boundaries according to the Manual on Uniform Traffic Control Devices (MUTCD).



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MKT-00014





A PRODUCT PORTFOLIO OF

# PREFORMED THERMOPLASTIC

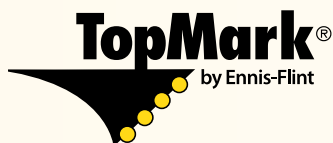
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Ennis-Flint manufactures and supplies a complete line of preformed thermoplastic pavement markings at our ISO 9001:2008 certified facility in Thomasville, North Carolina.

Ennis-Flint is devoted to increasing road safety awareness and is very active in private and public committees and task forces called upon to set standards and implement policies that will provide better roadway safety.

Traffic safety is not just the responsibility of the driver, pedestrian, cyclist or road worker. It is everyone's concern. While local municipalities and contractors look to us for the industry's most advanced and reliable products and responsive service, our commitment goes far beyond that.

We are even more passionate where the interests of our customers are concerned. Employees of Ennis-Flint are committed to providing exceptional service and value including:

- » Free product demonstrations
- » Hands-on training in the field
- » The industry's shortest delivery times
- » Real time answers to our customers' toughest questions
- » In-house technical support
- » Custom-made specialty markings

This brochure provides an overview of the products and services offered by Ennis-Flint. We invite you to contact our Product Support Team for more information or to discover how our products can help meet your traffic safety needs.

**Contact Us:**

Ennis-Flint  
115 Todd Court  
Thomasville, NC 27360  
Phone: (800) 331-8118  
Fax: (336) 475-7900  
email: [sales@ennisflint.com](mailto:sales@ennisflint.com)  
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# PREFORMED THERMOPLASTIC PAVEMENT MARKINGS



## PreMark® Pavement Markings

- Heavy-duty, durable intersection grade pavement marking material
- Complies with MUTCD; used primarily for regulatory markings on public streets and highways and private properties
- Supplied at 125 mil for cost-effective service life
- Lasts 6 to 8 times longer than paint
- No minimum ambient or road temperature requirements; pavement marking season can be extended into colder months
- Preheating pavement to specific temperature is not required
- Retroreflective; glass beads mixed throughout material so that as marking wears new beads exposed
- Precut; ready to use out of the carton
- Clean, crisp appearance
- Quick and simple mobilization; no heavy equipment to set-up and clean
- Made at ISO 9001:2008 certified facility
- No lead chromate or VOCs
- Simple 3-step application process with Flint 2000 EX Heat Torch

The top surface of the material has regularly spaced heating indicators which provide a visual cue during application that the material has reached a molten state indicating satisfactory adhesion and proper bead embedment has been achieved. The heating indicators also provide a post-application visual cue that the installation procedures have been followed.



### ViziGrip®

Specially made for crosswalks, bike paths, handicap markings and other pedestrian uses, ViziGrip® is a unique feature designed to ensure that skid resistance and retroreflectivity are optimized especially where loss of traction in wet conditions is of great concern.

ViziGrip® can be added to any of the PreMark® lines, legends, arrows, and other designs in 90-mil and 125-mil thicknesses.



## PreMark® Contrast Markings

Enhance contrast and improve visibility day and night with PreMark® Contrast Markings for light-colored asphalt and concrete applications.

**BORDER CONTRAST**



The white and yellow 125-mil PreMark® material is retroreflective and skid resistant while the black contrasting border is skid resistant and non-reflective.

**BLOCK CONTRAST**



PreMark® Block Contrast Markings are available in 125-mil and provide even greater visibility. PreMark® Contrast Markings are convenient to use because the two colors of material are interconnected for easier handling and positioning.

The 4", 5" and 6" width white or yellow linear material has a 1.5" contrasting border. The 8" width linear material has a 3" contrasting border. For lines wider than 8", use black linear PreMark® material.

## PreMark® Storm Drain Markings



PreMark® Storm Drain Markings are designed to educate the public and increase awareness about dangers of pollutants flowing into our water system.

These markings include messages such as "No Dumping!", "Drains to Ocean" and "No Dumping! It Kills". Unlike paint that can actually wash down the drain in a short time, PreMark® preformed thermoplastic markings stay in place so your messages remain easy to read and understand.

PreMark® Storm Drain Markings with ViziGrip® are made of durable preformed thermoplastic which provides enhanced visibility and skid resistance for pedestrian safety.



There are many designs available with the most typical being a 29" x 5" marking with two layers of PreMark® consisting of a blue non-beaded base layer with a white beaded stencil top layer.



## PreMark® Interstate and Route Shields

There has been a growing use of these "horizontal surface signs" in lieu of, or as a supplement to the typical shoulder-mounted or overhead traffic signs.



Standard sizes are 4' x 10', 6' x 15' and 8' x 20'.

Many states are discovering these shields help improve traffic flow

and safety by providing a clear, concise message to direct motorists to the proper lane, before reaching a particular exit or intersection.



PreMark® Interstate Shields are simple to apply because the large marking comes packaged in layout sequence according to the particular design. The different colors

of material are interconnected making it easy and convenient to handle and position for application with a propane heat torch or a large radiant heater.

## PreMark® Heavy-Duty Adhesives

**BUNDY**



PreMark® Adhesives are made out of non-toxic, zero V.O.C. preformed thermoplastic.

Bundys® adhere raised pavement markers to the road surface and provide a bond that will last throughout the marker's lifetime. Each 5" x 5" Bundy® is made of 125-mil preformed thermoplastic. When heated with a propane heat torch, a Bundy® liquifies and fuses with the road surface and the marker providing a bond that will last throughout the marker's lifetime.

**SUPER BUNDY PLUS**



SuperBundy™ designed for applications where the object bonded to the road surface may be hit with extreme force. The SuperBundy™ Plus has resilient characteristics which enable it to remain flexible throughout its lifetime. It adheres

large objects on horizontal surfaces such as tubular markers, wheel stops, large "turtle" markers and buttons. Available in 2"x39" strips and 8"x8" pads.



# PREFORMED THERMOPLASTIC PAVEMENT MARKINGS

## PreMark® Bike Lane Markings

PreMark® Bike Lane Markings with ViziGrip®, available in 90-mil and 125-mil, provide a safe solution ensuring both skid resistance and retroreflectivity are optimized.

PreMark® Bike Boxes and Panels are also available for use in high-traffic areas subjected to vehicular traffic. The two colors of material are interconnected allowing the user to easily handle and position the marking prior to heating.

*See the PreMark Price List for standard sizes and options.*



## PreMark® Manhole Protection Rings (MPRs)

PreMark® MPRs offer year-round Protection against damage. Road construction, resurfacing and sewer maintenance can result in manhole covers that do not match the exact grade and crown of the road. The PreMark® Manhole Protection Ring System is designed with a subtle incline that provides a smooth, damage-free ride for daily traffic. MPRs help solve equipment maintenance concerns and potential injury hazards.

Each ring is made of durable non-beaded 125-mil PreMark® material. As many as three rings can be combined to create a smooth transition. Actual ring dimensions depend on the size of the manhole or valve cover.

*See the PreMark Price List for standard sizes.*



## PreMark® In-Lane Rumble Bars

Using audible and vibratory signals, PreMark® In-Lane Rumble Bars help reduce driver risk and unsafe driving practices due to special road conditions.

Base layer is 125-mil non-beaded PreMark® and the top layer is a 250-mil PreMark® Rumble Bar; both layers must be used together. It is effective to use in combination with appropriate signage and word legends.

Situations where rumble bars could be effective include, but are not limited to, high incident areas, approaches to newly-installed stop signs or traffic lights, railroad crossings, signalized controlled intersections, work zones, toll facilities, hazardous curves, and rural high-speed intersections with sight restrictions.

PreMark® Rumble Bars are available in black, white, yellow and orange. Maintenance is easy as a new rumble bar section can be easily cut to fit any worn or damaged area.

*See the PreMark Price List for standard sizes.*



## PreMark® Handicap Markings

PreMark® Handicap Markings with ViziGrip® are virtually maintenance free and durable enough to last 6 to 8 times longer than painted surfaces. These high-visibility markings are ADA compliant and offer high skid resistance for pedestrian safety. Although available in a variety of sizes, the standard PreMark® Handicap Kit (40"x40" white symbol on a blue background) is compliant with the FHWA Standard Highway Signs Book.

PreMark® Accessibility Kits are more convenient to install because the two-colored material is physically held together with a compatible material allowing the user to easily handle and position the marking prior to application.

*See the PreMark Price List for standard sizes.*





## Preformed Thermoplastic Pavement Markings

- Heavy-duty, durable intersection grade pavement marking material
- Preheating pavement to specific temperature is required
- Complies with MUTCD; used primarily for regulatory markings on public streets and highways and private properties
- Supplied at 125-mil and 90-mil
- Retroreflective; glass beads mixed throughout material so that as the marking wears new beads exposed
- White and yellow linear material available in rolls
- SkidOptics™ provides enhanced skid resistance
- Precut; ready to use out of the carton
- Clean, crisp appearance
- Made at ISO 9001:2008 certified facility
- No lead chromate or VOCs
- Quick and simple mobilization; no heavy equipment to set-up and clean
- Simple 3-step application process with Magnum Heat Torch



Consider the optional cylinder trolley. It provides an easy way to transport heat torches and propane cylinders.

## Flint 2000 EX™ Heat Torch

### Safety Makes the Flint 2000 EX™ Stand Out

With its patented cold burning fan-shaped nozzle, the Flint 2000 EX™ propane heat torch is specially designed for installing preformed thermoplastic pavement markings and adhesives. The fan-shaped nozzle ensures even heating when applying preformed thermoplastic in any season, but especially in windy, wet spring months. The swivel hose connector prevents kinks and twisting.

This UL-listed heat torch features and electric ignition, hand guard, deadman trigger, and an automatic shut-off valve with POL fittings for maximum safety.

It can also be used for removal of paint, drying loop detector grooves, removal of cold plastic and temporary tape, shrinking plastic for wrapping, drying road surfaces and for melting snow or ice.

Using the Flint 2000 EX™ to apply preformed thermoplastic pavement markings will reduce the likelihood that the surface glass beads will sink too much when heating. Other heat torches may put out so much concentrated heat in one spot that it is virtually impossible to control the embedment of the surface glass beads which can result in lower initial retroreflectivity.



## Surface-Applied Detectable Warning Material

- Applies on concrete (including green) and asphalt; new and existing surfaces
- Supplied in convenient kit to complete 32 sq. ft. of application
- Complies with current Public Rights-of-Way Accessibility Guidelines (PROWAG) and ADAABA-Accessibility Guidelines (formerly ADAAG)
- New convenient 2'x4' sheet; also in 2'x3', 1'x2', 1'x3', plus a wedge piece
- Conforms to contours
- Easy to cut with heavy-duty scissors for special angles and curves
- No fasteners, anchors or power tools required
- Quick and simple mobilization
- Slip resistant; abrasive component throughout material
- Long-lasting color pigments are organic and contain no heavy metals
- The truncated domes are integral parts of the material - not add-ons.
- Made at ISO 9001:2008 certified facility
- Simple 4-step application process with Flint 2000EX® Heat Torch



### Typical Colors



## Horizontal Surface Signage

- Durable intersection-grade preformed thermoplastic pavement marking material
- Enhance regulatory transportation and pedestrian guidance; promote community pride and safety
- Precut; ready to use out of the carton
- Interconnected shapes and colors; easy to handle
- Lasts 6 to 8 times longer than paint
- ViziGrip® provides enhanced visibility and skid/slip resistance
- Material flush to surface; no tripping hazard; wheelchair/shopping cart-friendly
- Clean, crisp appearance
- No minimum ambient or road temperature requirements; pavement marking season can be extended into colder months
- Heating indicators in surface of material provide visual cue for proper application
- Made at ISO 9001:2008 certified facility
- No lead chromate or VOCs
- Application on asphalt and concrete
- Simple application process with propane heat torch or large heater







**ENNIS-FLINT®**

A Traffic Safety Solutions Company

[www.ennisflint.com](http://www.ennisflint.com)

**CORPORATE OFFICE**

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# Instructions

Assembly  
Installation  
Operation

7/2007

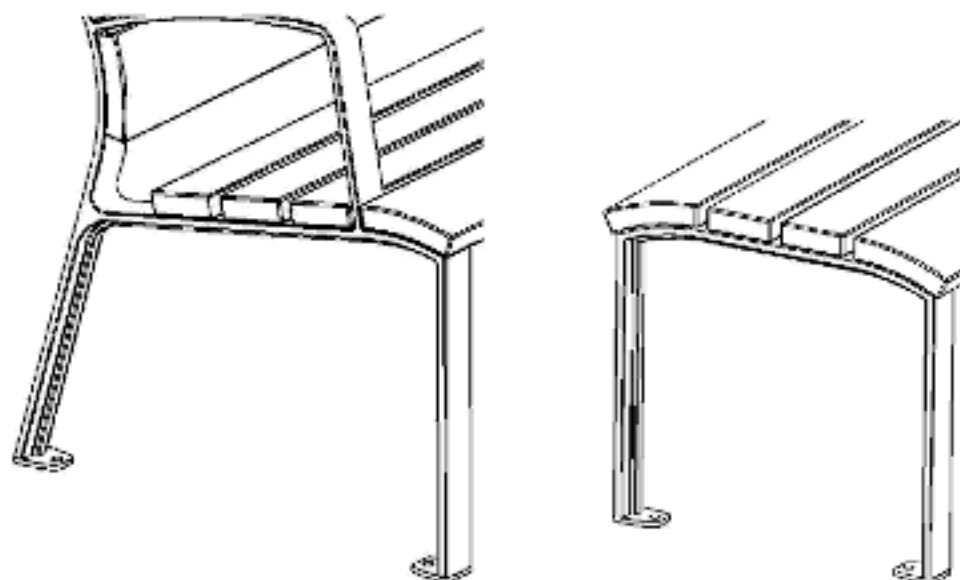
## Neoliviano Bench

**HANDLE WITH CARE!** Do not place or slide parts on concrete or other hard or abrasive surfaces.

### Recommended procedure for surface mounting:

Each surface mount bench is shipped with two mounting plates installed on every support casting. Each plate can accept one anchor up to 3/8" diameter. Although the anchoring procedure and hardware are the responsibility of the installer, we suggest the following:

1. Select corrosion resistant anchors appropriate for the surface. Your hardware store or builders supply may be able to recommend the proper hardware, tools, and safety equipment.
2. Check the screws that fasten the mounting plates to the bench. Align plates as shown below and tighten mount screws with a 6mm Allen wrench if necessary.
3. Place the bench in the desired position.
4. Mark hole locations.
5. Move the bench to allow access for drilling holes.
6. Install the anchors and bench according to the anchor manufacturer's instructions.



Correct tab alignment for backed and backless benches shown above.

landscapeforms®

Page 1 of 2



# Instructions

Assembly  
Installation  
Operation

## Recommended procedure for embedded mounting:

Each embedded bench is shipped with two M10 threaded rods per support casting. For mounting to existing concrete, we recommend using an adhesive anchoring system (Hilti HIT RE 500 or Powers Fasteners AC100 PLUS™). These products may be used in wet or dry conditions. Gel and cure times vary with temperature. Each bench support requires approximately 1-1/2 ounces of adhesive. Although the anchoring procedure is the responsibility of the installer, we suggest the following:

1. Place bench upside down on non-marring material.
2. Locate and install two M10 threaded rods in each support. Leave 4" of threaded rod sticking out of the support. DO NOT thread rods in until they bottom out.
3. Place the bench in the desired position.
4. Mark hole locations around rods.
5. Move the bench to allow access for drilling holes.
6. Hammer drill 5/8" holes, 4-1/2" deep.
7. Clean holes carefully using a 1" diameter nylon brush and compressed air. For best results use a nozzle that reaches the bottom of the hole. Holes must be free of standing water or ice.
8. Follow the manufacturer's instructions for dispensing adhesive. Fill the holes from the bottom up to avoid air pockets. Fill to a level 1" from the top of each hole. (The adhesive level should rise to the top of the hole as the bench is set in place.)
9. Set the bench in the installed position. Do not disturb the bench during the cure time.
10. Wipe away any spilled adhesive before it sets.

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 Kalamazoo, Michigan 49048  
 Phone: (800) 521-2546  
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 www.landscapeforms.com  
 specify@landscapeforms.com

## NeoLiviano bench Product Guide Specification

**Specifier Notes:** This product guide specification is written according to the Construction Specifications Institute (CSI) 3-Part Format, including *MasterFormat*, *SectionFormat*, and *PageFormat*, as described in *The Project Resource Manual—CSI Manual of Practice, Fifth Edition*.

The section must be carefully reviewed and edited by the Architect to meet the requirements of the project and local building code. Coordinate this section with other specification sections and the Drawings. Delete all "Specifier Notes" after editing this section.

Section numbers are from *MasterFormat 2010 Edition*.

### SECTION 12 93 43.13 BENCHES

**Specifier Notes:** This section covers Landscape Forms, Inc. "Neoliviano" benches. Consult Landscape Forms, Inc. for assistance in editing this section for the specific application.

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Benches.

##### 1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, storage and handling requirements and recommendations, installation methods and available colors, styles, patterns and textures.
- B. Shop Drawings: Submit manufacturer's shop drawings, including plans and elevations, indicating overall dimensions.
- C. Samples: Submit manufacturer's samples of materials, finishes, and colors.
- D. Warranty: Manufacturer's standard warranty.

##### 1.3 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Manufacturer regularly engaged in manufacture of site furnishings since 1969.
- B. Product Support: Products are supported with complete engineering drawings and design patents.
- C. Base Worth: An installed base of products worth in excess of one hundred million dollars.
- D. Assets: Excess of twenty million dollars in assets.
- E. Production: Orders are filled within a 40-day schedule.
- F. Facility Operator: Welders and machine operators are certified.

##### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

- B. Storage: Store materials in clean, dry area in accordance with manufacturer's instructions. Keep materials in manufacturer's original, unopened containers and packaging until installation.
- C. Handling: Protect materials and finish during handling and installation to prevent damage.

## 1.5 **WARRANTY**

- A. Warranty Information:
  - Products will be free from defects in material and/or workmanship for a period of three years from the date of invoice.
  - The warranty does not apply to damage resulting from accident, alteration, misuse, tampering, negligence, or abuse.
  - Landscape Forms, Inc. shall, at its option, repair, replace, or refund the purchase price of any items found defective upon inspection by an authorized Landscape Forms service representative.
  - Purchasers should be aware that normal use of these high quality products can result in superficial damage affecting the finish. Scratches, nicks, and dents are to be considered normal wear and tear, and are not the responsibility of the manufacturer.

## **PART 2 PRODUCTS**

### 2.1 **MANUFACTURER**

- A. Landscape Forms, Inc., 7800 E. Michigan Ave, Kalamazoo, Michigan 49048.  
Phone: (800) 521-2546. Fax (269) 381-3455. Website [www.landscapeforms.com](http://www.landscapeforms.com)  
E-mail: [specify@landscapeforms.com](mailto:specify@landscapeforms.com)

### 2.2 **BENCHES**

- A. "Neoliviano" Benches

Specifier Notes: Specify bench style and length.

- B. Style:
  - 1. Backless
  - 2. Backed with Arms
- C. Length:
  - 1. Backless
    - a. 24 inches.
    - b. 59 inches.
    - c. 118 inches.
  - 2. Backed
    - a. 24 inches.
    - b. 69 inches.
    - c. 118 inches.

Specifier Notes: Specify bench mounting.

- D. Mounting:
  - 1. Embedded
  - 2. Surface mounted
  - 3. Freestanding

### 2.3 **MATERIALS**

- A. Cast Supports: Cast supports are made of A514 or A535 aluminum.
- B. Seat and Back Panels: Board thickness of 1-3/16 inches.

Specifier Notes: Specify wood seat and back panels. Delete materials not required.

1. Wood for Exterior Use:
  - a. Jarrah: Solid stock, select Australian hardwood.
2. Wood for Interior Use:
  - a. Jarrah: Solid stock, select Australian hardwood.

Specifier Notes: Delete if it does not apply.

- C. Center Strap: The center straps are made of 5/32" x 1" stainless steel.
- D. Mounting:
  1. Freestanding: Freestanding units have nylon 6-6-400 glides installed.
  2. Surface Mount: Surface mount units have type 304 stainless steel anchor tabs installed.
  3. Embedded: Embedded units are supplied with two 10mm x 120mm carbon steel with Magni-coat threaded rods for each support casting.

## 2.4 **ACCESSORIES**

Specifier Notes: Specify anchor bolts for surface-mounted benches. Delete for embedded or freestanding.

- A. Anchor Bolts: Corrosion resistant recommended (not supplied by manufacturer)

## 2.5 **RECYCLED CONTENT**

- A. Neoliviano Benches:
  - Recycled Material Content: Minimum 6 percent.
  - Post-Consumer Material Content: Minimum 3 percent.
  - Pre-Consumer Material Content: Minimum 3 percent.
  - Recyclable: 100 percent.

## 2.6 **FABRICATION**

- A. Shop assembled benches.

## 2.7 **FINISHES**

- A. Finish on Aluminum: Supports are anodized to provide corrosion protection.

Specifier Notes: Specify finish for exterior or interior use. Consult Landscape Forms, Inc. for more information.

- B. Finish on Wood:
  1. Wood for Exterior Use: Unfinished.
  2. Wood for Interior Use: Finished with "LF-80" catalyzed lacquer.

# **PART 3 EXECUTION**

## 3.1 **EXAMINATION**

- A. Examine areas to receive benches.
- B. Notify Architect of conditions that would adversely affect installation or subsequent use.
- C. Do not begin installation until unacceptable conditions are corrected.

## 3.2 **INSTALLATION**

- A. Install benches in accordance with manufacturer's instructions at locations indicated on the Drawings.

- B. Install benches level.
- C. Anchor benches securely in place, if surface mount or embedded.

### **3.3 ADJUSTING**

- A. Finish Damage: Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.
- B. Component Damage: Remove and replace damaged components that cannot be successfully repaired as determined by Architect.

### **3.4 CLEANING**

- A. Clean benches promptly after installation in accordance with manufacturer's instructions.
- B. Do not use harsh cleaning materials or methods that could damage finish.

### **3.5 PROTECTION**

- A. Protect installed benches to ensure that, except for normal weathering, benches will be without damage or deterioration at time of Substantial Completion.

**END OF SECTION**





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## **SECTION 129305 – EXPOSITION BENCHES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Exposition Benches
- B. Related Sections:
  - 1. Section 129335 – Exposition Trash Receptacles

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Samples for Verification: For each type of exposed finish, not less than 6-inch- long linear components and 4-inch square sheet components.

#### **1.4 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For site furnishings to include in maintenance manuals.

#### **1.5 WARRANTY**

- A. Manufacturer offers a limited-warranty and agrees to repair or replace steel, aluminum, and cast iron bench frames and bench assemblies that fail in materials or workmanship within specified warranty period only when product is assembled and installed per the manufacturers instruction provided with each shipment and item.
  - 1. Failures include the following:
    - a. Structural failures.
  - 2. Warranty excludes acts of vandalism, abuse, and misuse.
  - 3. Warranty Period: Twenty years from date of purchase.



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- B. Finish Warranty: Manufacturer agrees to repair finishes or replace components that show evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Deterioration includes the following:
    - a. Rust, fading, peeling, chipping, cracking, mold, and mildew.
  - 2. Warranty excludes acts of vandalism, abuse, and misuse.
  - 3. Warranty Period: Seven years from date of purchase.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURER**

- A. Manufacturer: Subject to compliance with requirements, provide the following products by ANOVA; St. Louis, MO; 888-535-5005; [www.anovafurnishings.com](http://www.anovafurnishings.com).

### **2.2 BENCHES STYLES**

- A. #LEXC6; 6' contoured bench w/ arms and back.
  - 1. Seat Height: 18-1/4".
  - 2. Overall Back Height: 33-3/8".
  - 3. Overall Depth: 25-1/4".
- B. #LEXF6; 6' flat bench.
  - 1. Seat Height: 18-1/4".
  - 2. Overall Back Height: 33-3/8".
  - 3. Overall Depth: 20-7/8".

### **2.3 COMPONENTS**

- A. Frame: Painted Steel.
- B. Seat and Back:
  - 1. Material:
    - a. Steel: 10 gauge steel perforated in a parallel strap pattern.
  - 2. Arms: One on each end.
    - a. Arm Material: 1/2" steel plate.
- C. Tested Bench Capacity: 200 lbs. per lineal foot.



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- D. Steel Finish: PVC-color coated.
  - 1. Color: As selected by Architect from manufacturer's full range.

## 2.4 MATERIALS

- A. Steel: Free of surface blemishes and complying with the following:
  - 1. Plates, Shapes, and Bars: ASTM A 36/A 36M.
  - 2. Sheet: Commercial steel sheet complying with ASTM A 1011/A 1011M.
- B. Fasteners, Fittings, and Hardware: Stainless steel commercial quality.

## 2.5 FABRICATION

- A. Metal Components: Steel strap design created with perforated steel panels formed to required shapes and sizes with true, consistent curves, lines, and angles. Separate metals from dissimilar materials to prevent electrolytic action.
- B. Welded Connections: Weld connections continuously. Weld solid members with full-length, full-penetration welds and hollow members with full-circumference welds. At exposed connections, finish surfaces smooth and blended so no roughness or unevenness shows after finishing and welded surface matches contours of adjoining surfaces.
- C. Tubes: Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of handrail and railing components.
- D. Exposed Surfaces: Sanded, or otherwise finished; all surfaces smooth, free of burrs, barbs, and sharpness; all edges and ends rolled or rounded.
- E. Factory Assembly: Assemble components in the factory to greatest extent possible to minimize field assembly. Clearly mark units for assembly in the field.

## 2.6 GENERAL FINISH REQUIREMENTS

- A. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## 2.7 STEEL AND IRON FINISHES

- A. PVC Finish: Manufacturer's standard .125 inch thick per surface, UV-light stabilized, mold-resistant, slip-resistant, matte-textured, dipped or sprayed-on, PVC-plastisol finish encapsulated with a richly tinted high performance patented Fusion Advantage™ topcoat; complying with



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coating manufacturer's written instructions for pretreatment, application, and minimum dry film thickness.

1. Fusion Advantage™ TopCoat: Complies with ASTM E 1354 and is compliant with California Uniform Fire Code 1103.2.2.4.2.
- B. Powder-Coat Finish: Manufacturer's standard, baked, polyester, powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.
- C. Primer: Manufacturers standard fade-resistant powder coat over state-of-the-art primer applied to all under supports to provide rust fighting protection and durability exceeding industry standards by 34% when tested by independent sources.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 INSTALLATION, GENERAL**

- A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.
- B. Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.
- C. Install site furnishings level, plumb, true, and securely anchored at locations indicated on Drawings.

END OF SECTION 129305



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## LEXC4— Exposition 4' Contour Bench

4' contour bench with steel slat seat, armrests and portable/surface mount legs

### Material

The 4' contour bench is composed of a 10-gauge steel slat seat with a .5" wide slot pattern and steel legs and armrests. The bench is 51.02" long and will support 200 lbs. per linear foot.

The bench is designed to be portable for flexibility in placement or surface mounted using predrilled .4" diameter holes in feet to prevent movement. Mounting hardware is not included.

### Finish

Steel slat seat is protected by the patented Fusion Advantage™ finish. The plastisol coating has an average thickness of .125" and is encapsulated with a richly tinted, high performance powder coating that won't rust, fade, peel, chip, crack, mold or mildew. The finish has been tested to the requirements of ASTM E1354 and determined to be in compliance with California Uniform Fire Code 1103.2.1.4.2.

Fade-resistant, powder coated steel legs, armrests and under supports features a state-of-the-art primer proven to prevent rusting. Treated components exceed the industry standard by 34% in testing by independent sources.

### Color

See website or sales representative for color choices.

### Assembly

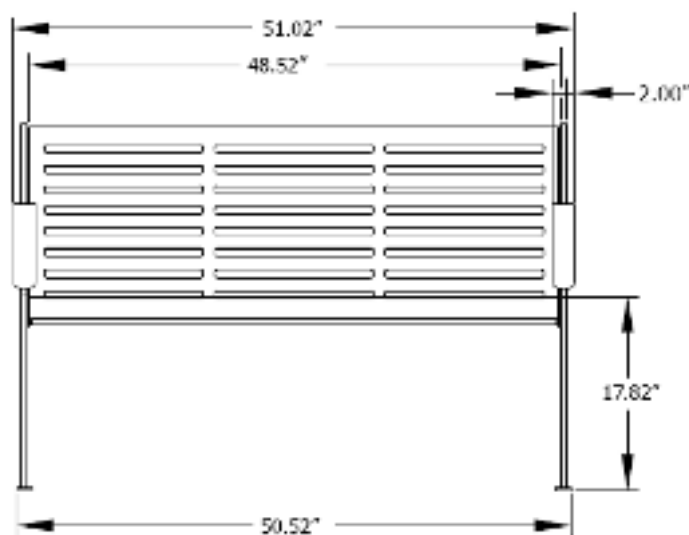
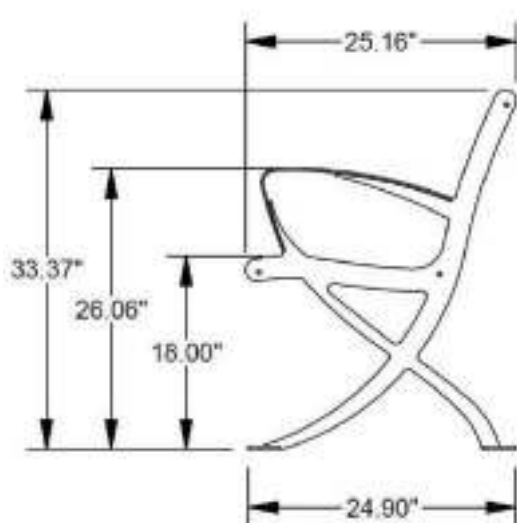
The bench requires some assembly. Stainless steel assembly hardware is included.

### Maintenance

The product is virtually maintenance-free and requires only periodic cleaning with a sponge and a solution of mild detergent and water to remove surface dirt. Do not clean with solvent or petroleum base products.

### Warranty

20-year limited structural warranty with 7-year finish warranty from the date of purchase. See full details on multi-year warranties for components at [www.anovafurnishings.com/warranty.aspx](http://www.anovafurnishings.com/warranty.aspx).



## SHIPPING INFORMATION

| Unit Weight | Unit Shipping Wt. UPS | Unit Shipping Wt. Truck (1+ Units) | Unit Ship Size w/Pallet | Max Units Per Pallet | Pallet Size/Wt. (32" x 48") | Total No. Pkgs. | Shipping Class |
|-------------|-----------------------|------------------------------------|-------------------------|----------------------|-----------------------------|-----------------|----------------|
| 126 lbs.    | N/A                   | 139 lbs./unit                      | 18 cu. ft.              | 6                    | 50 lbs.                     | 3               | 70             |





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## LEXC6— Exposition 6' Contour Bench

6' contour bench with steel slat seat, armrests and portable/surface mount legs

### Material

The 6' contour bench is composed of a 10-gauge steel slat seat with a .5" wide slot pattern and steel legs and armrests. The bench is 74.77" long and will support 200 lbs. per linear foot.

The bench is designed to be portable for flexibility in placement or surface mounted using predrilled .4" diameter holes in feet to prevent movement. Mounting hardware is not included.

### Finish

Steel slat seat is protected by the patented Fusion Advantage™ finish. The plastisol coating has an average thickness of .125" and is encapsulated with a richly tinted, high performance powder coating that won't rust, fade, peel, chip, crack, mold or mildew. The finish has been tested to the requirements of ASTM E1354 and determined to be in compliance with California Uniform Fire Code 1103.2.1.4.2.

Fade-resistant, powder coated steel legs, armrests and under supports features a state-of-the-art primer proven to prevent rusting. Treated components exceed the industry standard by 34% in testing by independent sources.

### Color

See website or sales representative for color choices.

### Assembly

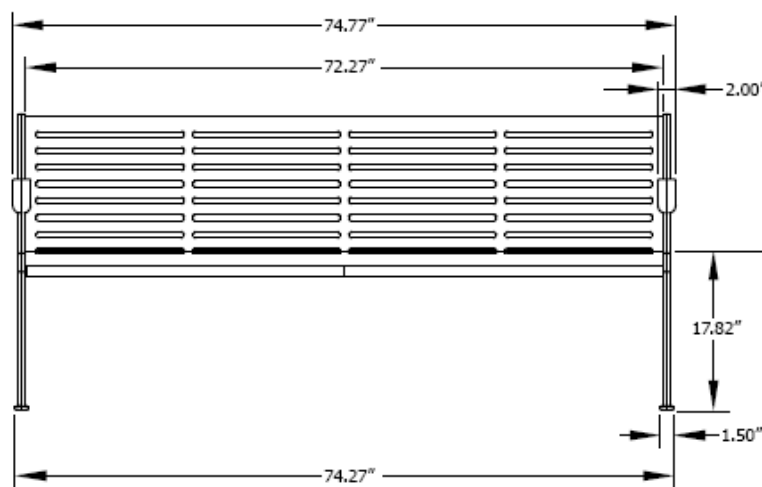
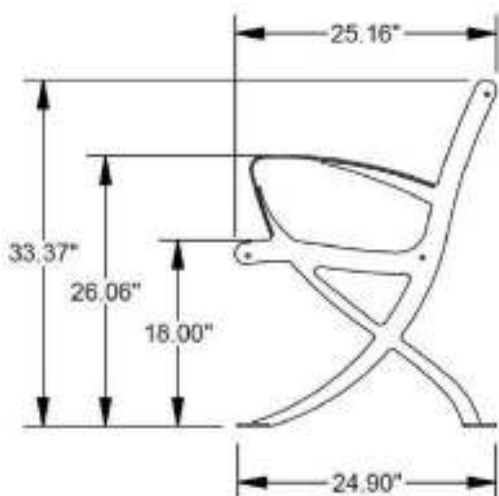
The bench requires some assembly. Stainless steel assembly hardware is included.

### Maintenance

The product is virtually maintenance-free and requires only periodic cleaning with a sponge and a solution of mild detergent and water to remove surface dirt. Do not clean with solvent or petroleum base products.

### Warranty

20-year limited structural warranty with 7-year finish warranty from the date of purchase. See full details on multi-year warranties for components at [www.anovafurnishings.com/warranty.aspx](http://www.anovafurnishings.com/warranty.aspx).



## SHIPPING INFORMATION

| Unit Weight | Unit Shipping Wt. UPS | Unit Shipping Wt. Truck (1+ Units) | Unit Ship Size w/Pallet | Max Units Per Pallet | Pallet Size/Wt. (32" x 74") | Total No. Pkgs. | Shipping Class |
|-------------|-----------------------|------------------------------------|-------------------------|----------------------|-----------------------------|-----------------|----------------|
| 159 lbs.    | N/A                   | 176 lbs./unit                      | 27 cu. ft.              | 6                    | 100 lbs.                    | 3               | 70             |

8/27/2015

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# Assembly Instructions

**LEXC4** Exposition 4' Contour Bench

**LEXC5** Exposition 5' Contour Bench

**LEXC6** Exposition 6' Contour Bench

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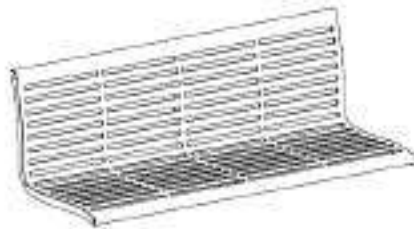
888.535.5005 tel

## TOOLS NEEDED:

- ½" Open-end or box-end wrench or ratchet with ½" socket
- Phillips head screwdriver



## BENCH COMPONENTS:



(1) Bench Seat



(2) Bench Supports

**ASSEMBLY HARDWARE:** All hardware is stainless steel.



(6) 5/16" x 1 1/2"  
Phillips Head Screws



(6) 5/16"  
Nylock Nuts



(6) 5/16"  
Flat Washers



(8) Plastic  
Rectangular Feet



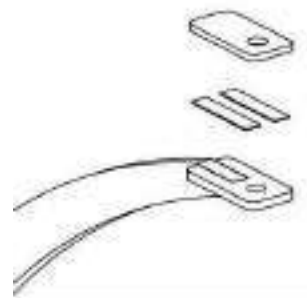
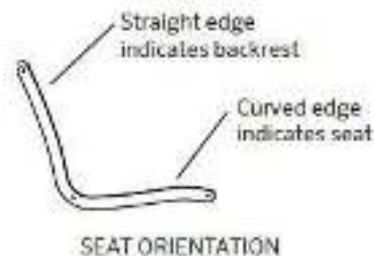
(16) Adhesive  
Strips

## ASSEMBLY:

1. Inspect the shipping container contents for damage and to determine that all components and hardware are present.
2. Assemble the bench over the shipping packaging or padded work area to avoid scratching the product.

**NOTE: Before assembling the nuts to the screws, it is recommended that a light oil or petroleum jelly be applied to the screw threads.**

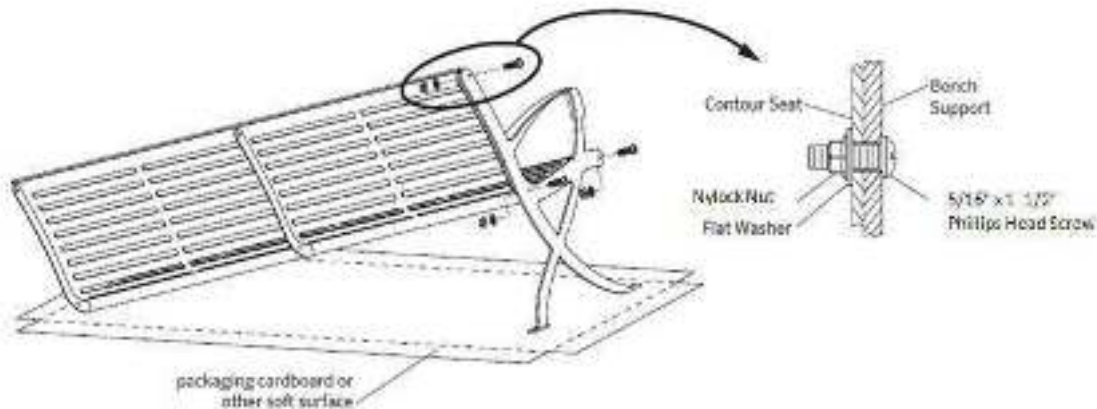
3. Locate one of the bench supports and position it near the end of the seat. Before proceeding, double-check that the seat portion is oriented horizontally and the back rest is vertical before assembling. The front edge of the seat portion of the bench has a slight curve to it. The mounting holes will not match up unless the bench seat is aligned to the bench supports in the proper orientation.
4. Apply two adhesive strips to one of the plastic rectangular feet. Then firmly apply the plastic rectangular to the metal foot of the bench support aligning the holes in each. Repeat for each of the remaining feet.



- Align the mounting holes in the bench support with the holes on one end of the bench seat. Insert one of the 5/16" x 1 1/2" Phillips head screws through both parts, with the screw head on the outside surface of the bench support. Place a 5/16" flat washer and 5/16" Nylock nut on the inside end of the screw and finger tighten.

**NOTE: Installing the Phillips head screws in this direction reduces the risk of scratching during use. Leave the hardware finger tight so that adjustments can be made during assembly and leveling.**

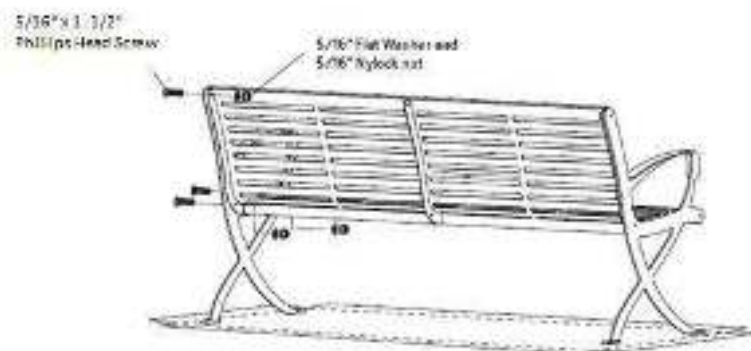
- Repeat step 5 for the other side of the bench. Again, leave the hardware finger tight.



- After all of the screws are installed, use the 1/2" open-end wrench, 1/2" box-end wrench or ratchet with a 1/2" socket to tighten.
- Move the bench to the location where it will be used.

**NOTE: The feet of the bench include surface mounting holes for permanent installations.**

- After two weeks, retighten all of the hardware.



**NOTE: Please contact Customer Care at 1-866-797-1761 to receive assistance in placing a replacement part order.**



**WARNING**

- Furniture must not be used other than for its intended purpose and should be inspected regularly for loose, missing, or broken hardware, and general instability.
- Furniture that is damaged or appears to be unstable must be removed from service and be repaired or replaced.
- Repairs must be made using only factory authorized parts and methods.

**CARE AND MAINTENANCE**

- Do not drag the assembled unit across any surface.
- This product requires only periodic cleaning with a sponge and a solution of mild detergent and water to remove surface dirt. Do not clean with a solvent or petroleum based products.



211 North Lindbergh Blvd.  
St. Louis, MO 63141  
800.231.1327 tel. | 314.754.0835 fax  
[specify@anovafurnishings.com](mailto:specify@anovafurnishings.com)  
[anovafurnishings.com](http://anovafurnishings.com)

## LEXF4— Exposition 4' Flat Bench

4' flat bench with steel slat seat and portable/surface mount legs

### Material

The 4' flat bench is composed of a 10-gauge steel slat seat with a .5" wide slot pattern and steel legs. The bench is 49.85" long and will support 200 lbs. per linear foot.

The bench is designed to be portable for flexibility in placement or surface mounted using predrilled .4" diameter holes in feet to prevent movement. Mounting hardware is not included.

### Finish

Steel slat seat is protected by the patented Fusion Advantage™ finish. The plastisol coating has an average thickness of .125" and is encapsulated with a richly tinted, high performance powder coating that won't rust, fade, peel, chip, crack, mold or mildew. The finish has been tested to the requirements of ASTM E1354 and determined to be in compliance with California Uniform Fire Code 1103.2.1.4.2.

Fade-resistant, powder coated steel legs and under supports features a state-of-the-art primer proven to prevent rusting. Treated components exceed the industry standard by 34% in testing by independent sources.

### Color

See website or sales representative for color choices.

### Assembly

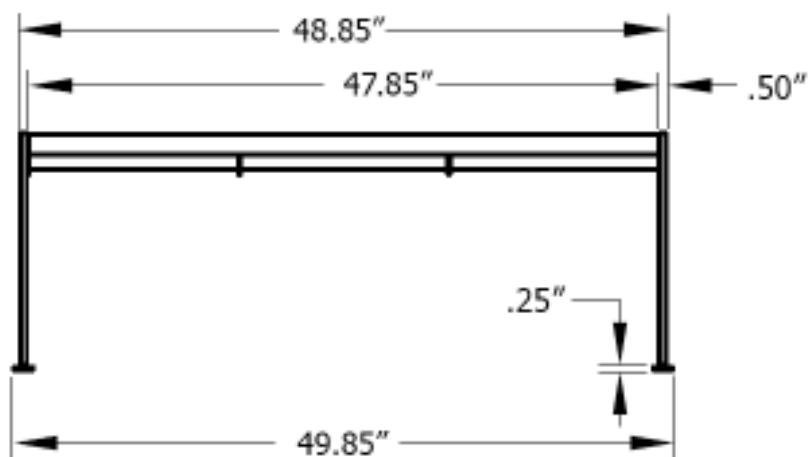
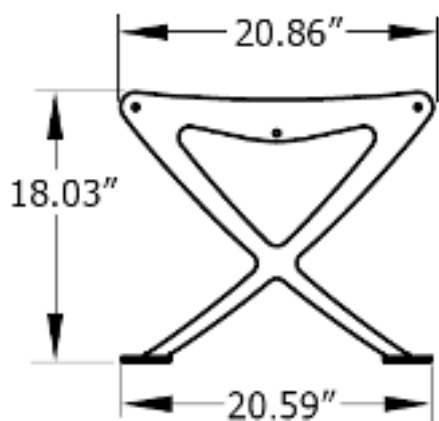
The bench requires some assembly. Stainless steel assembly hardware is included.

### Maintenance

The product is virtually maintenance-free and requires only periodic cleaning with a sponge and a solution of mild detergent and water to remove surface dirt. Do not clean with solvent or petroleum base products.

### Warranty

20-year limited structural warranty with 7-year finish warranty from the date of purchase. See full details on multi-year warranties for components at [www.anovafurnishings.com/warranty.aspx](http://www.anovafurnishings.com/warranty.aspx).



## SHIPPING INFORMATION

| Unit Weight | Unit Shipping Wt. UPS | Unit Shipping Wt. Truck (1+ Units) | Unit Ship Size w/Pallet | Max Units Per Pallet | Pallet Size/Wt. (32" x 48") | Total No. Pkgs. | Shipping Class |
|-------------|-----------------------|------------------------------------|-------------------------|----------------------|-----------------------------|-----------------|----------------|
| 74 lbs.     | N/A                   | 80 lbs./unit                       | 18 cu. ft.              | 6                    | 50 lbs.                     | 3               | 70             |



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800.231.1327 tel. | 314.754.0835 fax  
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[anovafurnishings.com](http://anovafurnishings.com)

## LEXF6— Exposition 6' Flat Bench

### 6' flat bench with steel slat seat and portable/surface mount legs

#### Material

The 6' flat bench is composed of a 10-gauge steel slat seat with a .5" wide slot pattern and steel legs. The bench is 74.25" long and will support 200 lbs. per linear foot.

The bench is designed to be portable for flexibility in placement or surface mounted using predrilled .4" diameter holes in feet to prevent movement. Mounting hardware is not included.

#### Finish

Steel slat seat is protected by the patented Fusion Advantage™ finish. The plastisol coating has an average thickness of .125" and is encapsulated with a richly tinted, high performance powder coating that won't rust, fade, peel, chip, crack, mold or mildew. The finish has been tested to the requirements of ASTM E1354 and determined to be in compliance with California Uniform Fire Code 1103.2.1.4.2.

Fade-resistant, powder coated steel legs and under supports features a state-of-the-art primer proven to prevent rusting. Treated components exceed the industry standard by 34% in testing by independent sources.

#### Color

See website or sales representative for color choices.

#### Assembly

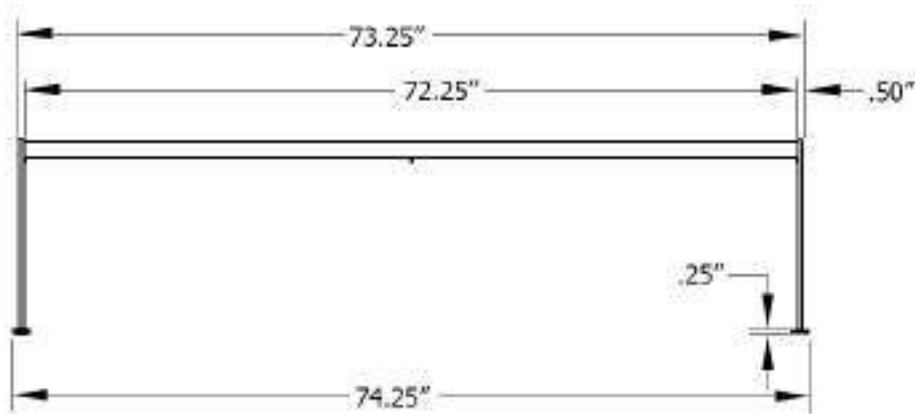
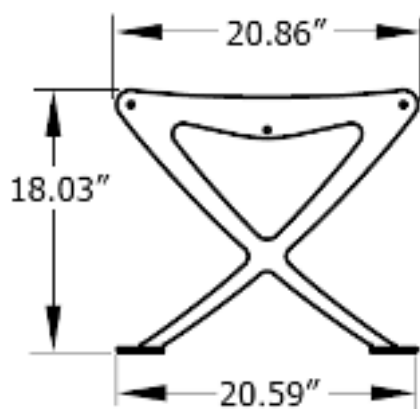
The bench requires some assembly. Stainless steel assembly hardware is included.

#### Maintenance

The product is virtually maintenance-free and requires only periodic cleaning with a sponge and a solution of mild detergent and water to remove surface dirt. Do not clean with solvent or petroleum base products.

#### Warranty

20-year limited structural warranty with 7-year finish warranty from the date of purchase. See full details on multi-year warranties for components at [www.anovafurnishings.com/warranty.aspx](http://www.anovafurnishings.com/warranty.aspx).



## SHIPPING INFORMATION

| Unit Weight | Unit Shipping Wt. UPS | Unit Shipping Wt. Truck (1+ Units) | Unit Ship Size w/Pallet | Max Units Per Pallet | Pallet Size/Wt. (32" x 74") | Total No. Pkgs. | Shipping Class |
|-------------|-----------------------|------------------------------------|-------------------------|----------------------|-----------------------------|-----------------|----------------|
| 114 lbs.    | N/A                   | 120 lbs./unit                      | 18 cu. ft.              | 6                    | 100 lbs.                    | 3               | 70             |





## Assembly Instructions

**LEXF4** Exposition 4' Flat Bench

**LEXF5** Exposition 5' Flat Bench

**LEXF6** Exposition 6' Flat Bench

anovafurnishings.com

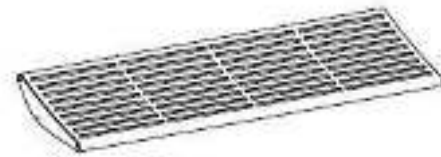
888.535.5005 tel

### TOOLS NEEDED:

- ½" Open-end or box-end wrench  
or ratchet with ½" socket
- Phillips head screwdriver



### BENCH COMPONENTS:



(1) Bench Seat



(2) Bench Supports

**ASSEMBLY HARDWARE:** All hardware is stainless steel.



(6) 5/16" x 1 1/2"  
Phillips Head Screws



(6) 5/16"  
Nylock Nuts



(6) 5/16"  
Flat Washers



(8) Plastic  
Rectangular Feet



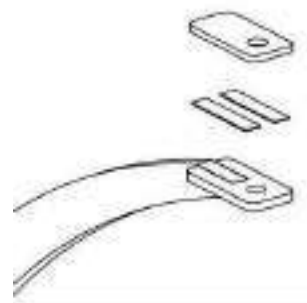
(16) Adhesive  
Strips

### ASSEMBLY:

1. Inspect the shipping container contents for damage and to determine that all components and hardware are present.
2. Assemble the bench over the shipping packaging or padded work area to avoid scratching the product.

**NOTE: Before assembling the nuts to the screws, it is recommended that a light oil or petroleum jelly be applied to the screw threads.**

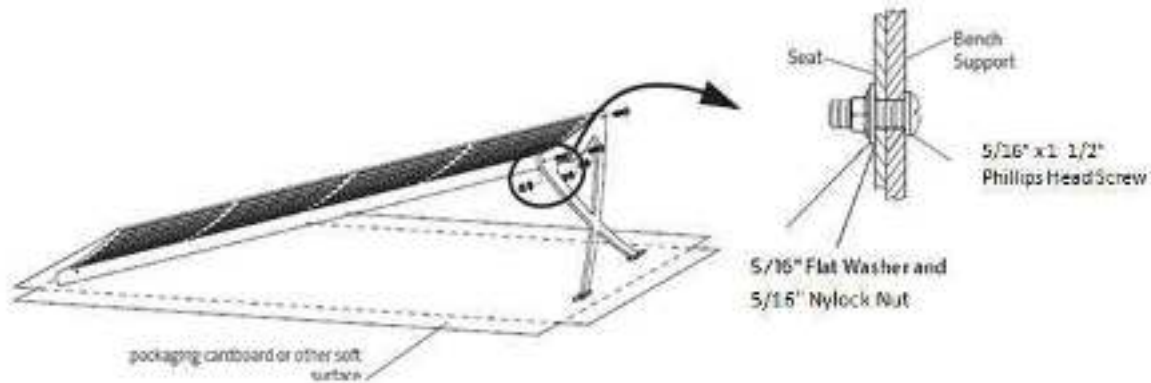
3. Locate one of the bench supports and position it near the end of the seat. The mounting holes will not match up unless the bench seat is aligned to the bench supports in the proper orientation.
4. Apply two adhesive strips to one of the plastic rectangular feet. Then firmly apply the plastic rectangular to the metal foot of the bench support aligning the holes in each. Repeat for each of the remaining feet.



- Align the mounting holes in the bench support with the holes on one end of the bench seat. Insert one of the 5/16" x 1 1/2" Phillips head screws through both parts, with the screw head on the outside surface of the bench support. Place a 5/16" flat washer and 5/16" Nylock nut on the inside end of the screw and finger tighten.

**NOTE: Installing the Phillips head screws in this direction reduces the risk of scratching during use. Leave the hardware finger tight so that adjustments can be made during assembly and leveling.**

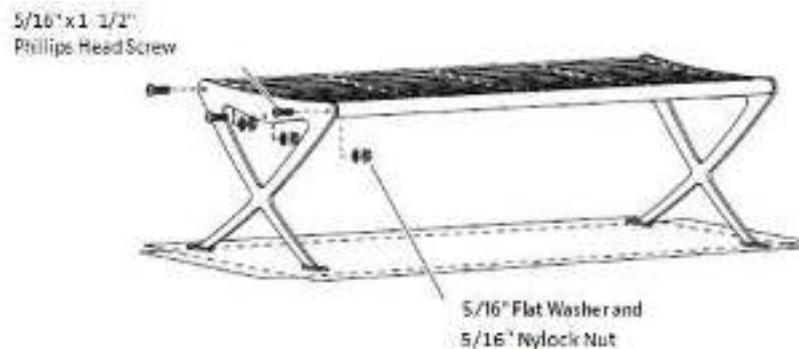
- Repeat step 5 for the other side of the bench. Again, leave the hardware finger tight.



- After all of the screws are installed, use the 1/2" open-end wrench, 1/2" box-end wrench or ratchet with a 1/2" socket to tighten.
- Move the bench to the location where it will be used.

**NOTE: The feet of the bench include surface mounting holes for permanent installations.**

- After two weeks, retighten all of the hardware.



**NOTE: Please contact Customer Care at 1-866-797-1761 to receive assistance in placing a replacement part.**



- Furniture must not be used other than for its intended purpose and should be inspected regularly for loose, missing, or broken hardware, and general instability.
- Furniture that is damaged or appears to be unstable must be removed from service and be repaired or replaced.
- Repairs must be made using only factory authorized parts and methods.

**CARE AND MAINTENANCE**

- Do not drag the assembled unit across any surface.
- This product requires only periodic cleaning with a sponge and a solution of mild detergent and water to remove surface dirt. Do not clean with a solvent or petroleum based products.



*Spending lunch in Camelot since 1962.*

*For over 50 years, Victor Stanley has designed, engineered, and manufactured timeless site furnishings so you can bring communities to life. Using genuine IPE wood slats and solid steel with exceptionally high recycled content, our new Reverie collection is the perfect marriage of sleek design, longevity, and comfort.*



*Create a timeless moment.®*



*The Reverie collection expresses simplicity, minimalism, and functionality. The Eva bench (patented) embodies the collection's attention to high quality design, craftsmanship, and comfort. Its slim profile, solid steel frame with exceptionally high recycled content, and use of genuine IPE wood slats, makes for sleek design, with longevity and comfort in mind. It's just one more way Victor Stanley helps you create the perfect setting for timeless moments.*

## **EVA BENCH\*** **EVA BACKLESS BENCH**

2, 4, 6 or 8 ft (.61, 1.2, 1.8 or 2.4 m) length. Wood slats. 8 ft (2.4 m) length includes center arm/leg.

\*US Patents D710,625 S; D710,139 S.

### **OPTIONS**

Surface mount. In-ground mount. Intermediate armrests (bolt-on) for 4 or 6 ft (1.2 or 1.8 m) length.



## **EVA TABLE**

18 in (457 mm) height. Wood slats.

Model EVAT-22: 2 x 2 ft (.61 x .61 m).

Model EVAT-32: 3 x 2 ft (.91 x .61 m).

Model EVAT-33: 3 x 3 ft (.91 x .91 m).

### **OPTIONS**

Surface mount. In-ground mount.



EVAT-32

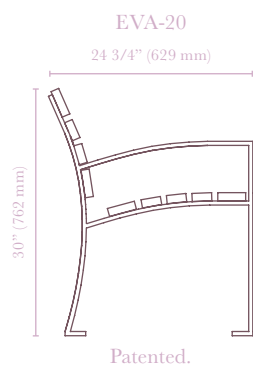
*See product specifications for further details. Drawings are not to scale. Natural wood colors will vary. Weathering may occur on site which will alter the color of the wood over time. Our TGIC powder-coating averages 8-10 mils (200-250 microns) thick and is applied in-house to ensure the highest level of quality. Offered in 12 standard and metallic colors, plus a full range of RAL colors with available color matching. Additional cost may apply.*



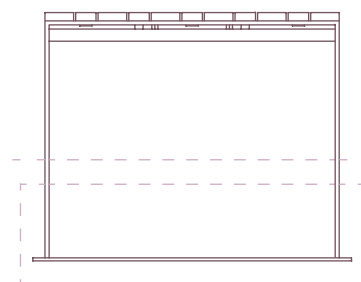
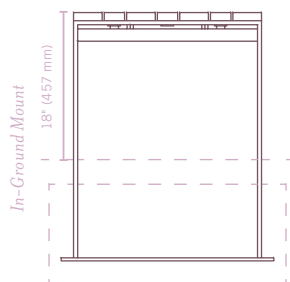
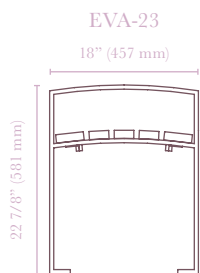
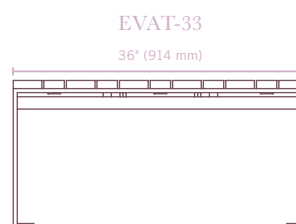
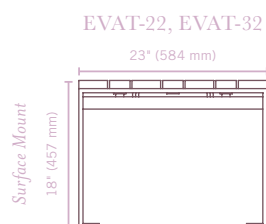
Patented.



EVAT-22



Patented.



2 ft (.61 m) length. Patented.



EVAT-33





*Victor Stanley, a leader in quality site furnishings, helps you bring your visions to life. From benches and litter receptacles to bike racks and planters, we meticulously design, engineer, and manufacture every detail to ensure our site furnishings will withstand the test of time. Founded over 50 years ago, we help create a place for people to gather, live life, and make timeless moments.*



*Create a timeless moment.®*

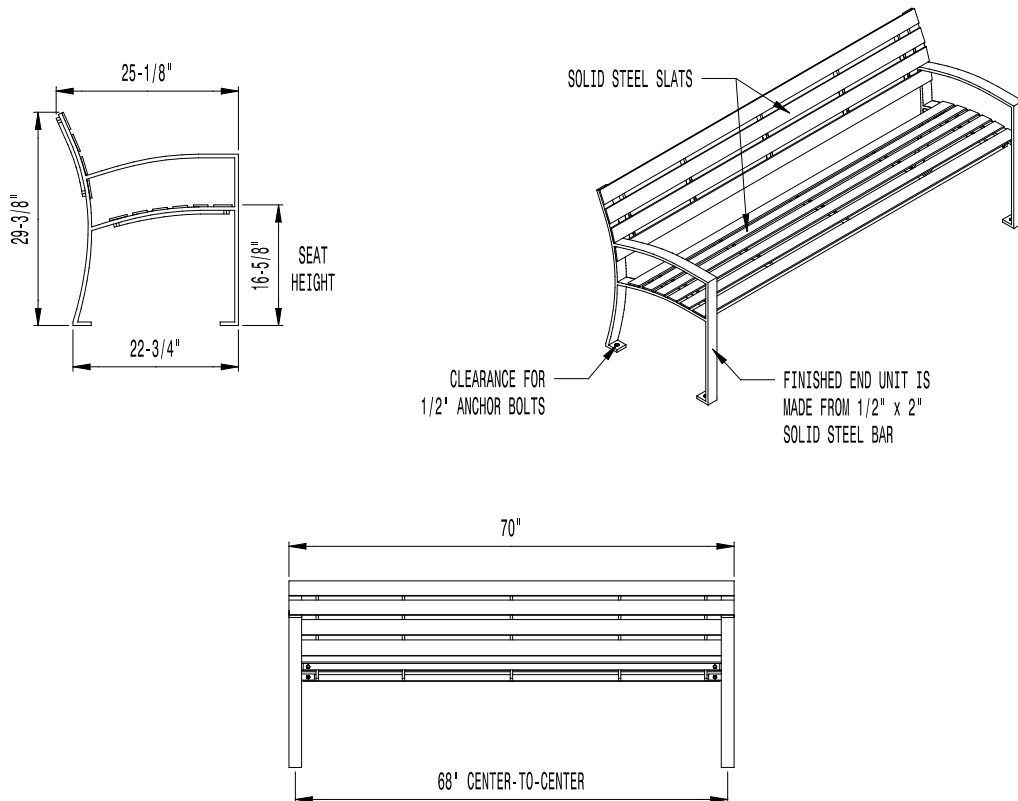


Create a timeless moment.®

\* ALL DIMENSIONS ARE IN INCHES \*

P.O. DRAWER 330 - DUNKIRK, MD 20754 USA  
TOLL FREE: (800) 368-2573 (USA & CANADA)  
TEL (301) 855-8300 - FAX (410) 257-7579  
WEB SITE: [HTTP://WWW.VICTORSTANLEY.COM](http://www.victorstanley.com)

THIS PRODUCT IS COVERED BY THE  
FOLLOWING U.S. PATENTS D710,625



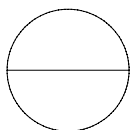
AVAILABLE OPTIONS:

POWDER COATING

10 STANDARD COLORS, 2 OPTIONAL METALLIC COLORS,  
CUSTOM COLORS (INCLUDING THE RAL RANGE)

NOTES:

1. DRAWINGS NOT TO SCALE. DO NOT SCALE DRAWINGS.
2. ALL FABRICATED METAL COMPONENTS ARE STEEL SHOTBLASTED, ETCHED, PHOSPHATIZED, PREHEATED, AND ELECTROSTATICALLY POWDER-COATED WITH T.G.I.C. POLYESTER POWDER COATINGS. PRODUCTS ARE FULLY CLEANED AND PRETREATED, PREHEATED AND COATED WHILE HOT TO FILL CREVICES AND BUILD COATING FILM. COATED PARTS ARE THEN FULLY CURED TO COATING MANUFACTURER'S SPECIFICATIONS. THE THICKNESS OF THE RESULTING FINISH AVERAGES 8-10 MILS (200-250 MICRONS).
3. IT IS NOT RECOMMENDED TO LOCATE ANCHOR BOLTS UNTIL BENCH IS IN PLACE. THIS VICTOR STANLEY, INC. PRODUCT MUST BE PERMANENTLY AFFIXED TO THE GROUND. CONSULT YOUR LOCAL CODES FOR REGULATIONS.
4. ANCHOR BOLTS NOT PROVIDED BY VICTOR STANLEY, INC.
5. FOR HIGH SALT ABUSIVE CLIMATES, HOT-DIP GALVANIZING BEFORE POWDER COATING IS AVAILABLE. HOT-DIP GALVANIZING IS PERFORMED FOR VICTOR STANLEY, INC. BY AN EXPERIENCED QUALIFIED FIRM TO WHICH PRODUCTS ARE SHIPPED FOR GALVANIZING. HOT-DIP GALVANIZING INCLUDES AN AGGRESSIVE PRE-TREATMENT AND IMMERSION IN A TANK OF CHARGED LIQUID ZINC AT OR AROUND 860°F (460°C). THE RESULTING SURFACE IS RESISTANT TO RUST BUT HAS SOME UNEVENNESS RESULTING FROM THE BONDING OF THE ZINC TO THE STEEL SURFACE. AS A RESULT, THE POWDER-COATING SURFACE FINISH OVER THAT GALVANIZED SURFACE MAY EXHIBIT BUMPS, UNEVENNESS, AND MAY NOT BE AS SMOOTH AS THE STANDARD FINISH; THIS UNEVEN AND INCONSISTENT FINISH IS NORMAL FOR GALVANIZING. CONTACT MANUFACTURER FOR DETAILS.
6. ALL SPECIFICATIONS ARE SUBJECT TO CHANGE. CONTACT MANUFACTURER FOR DETAILS.
7. THIS PRODUCT IS SHIPPED PARTIALLY UNASSEMBLED.



EVA-20-F

REVERIE

SPECIAL

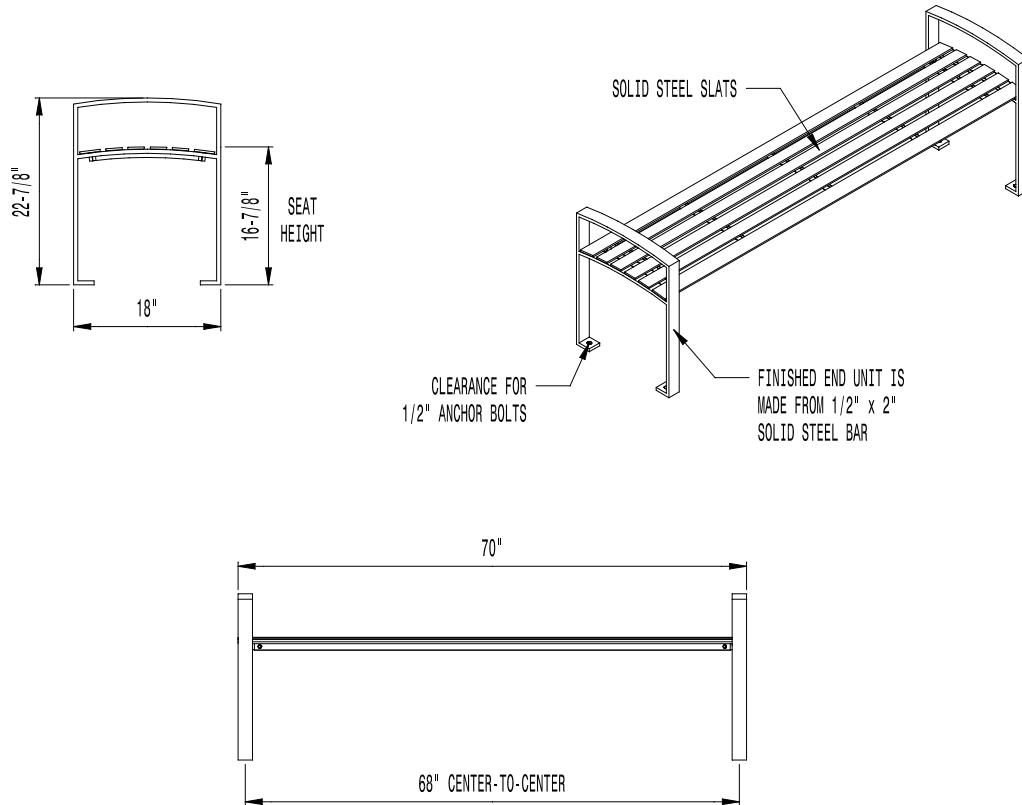
EVA BENCH WITH STEEL SLATS  
SHOWN: SPECIAL 6-FOOT LENGTH  
SPECIAL STEEL SLAT CONSTRUCTION



Create a timeless moment.®

\* ALL DIMENSIONS ARE IN INCHES \*

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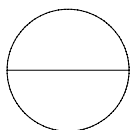
#### AVAILABLE OPTIONS:

##### POWDER COATING

10 STANDARD COLORS, 2 OPTIONAL METALLIC COLORS,  
CUSTOM COLORS (INCLUDING THE RAL RANGE)

#### NOTES:

1. DRAWINGS NOT TO SCALE. DO NOT SCALE DRAWINGS.
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3. IT IS NOT RECOMMENDED TO LOCATE ANCHOR BOLTS UNTIL BENCH IS IN PLACE. THIS VICTOR STANLEY, INC. PRODUCT MUST BE PERMANENTLY AFFIXED TO THE GROUND. CONSULT YOUR LOCAL CODES FOR REGULATIONS.
4. ANCHOR BOLTS NOT PROVIDED BY VICTOR STANLEY, INC.
5. FOR HIGH SALT ABUSIVE CLIMATES, HOT-DIP GALVANIZING BEFORE POWDER COATING IS AVAILABLE. HOT-DIP GALVANIZING IS PERFORMED FOR VICTOR STANLEY, INC. BY AN EXPERIENCED QUALIFIED FIRM TO WHICH PRODUCTS ARE SHIPPED FOR GALVANIZING. HOT-DIP GALVANIZING INCLUDES AN AGGRESSIVE PRE-TREATMENT AND IMMERSION IN A TANK OF CHARGED LIQUID ZINC AT OR AROUND 860°F (460°C). THE RESULTING SURFACE IS RESISTANT TO RUST BUT HAS SOME UNEVENNESS RESULTING FROM THE BONDING OF THE ZINC TO THE STEEL SURFACE. AS A RESULT, THE POWDER-COATING SURFACE FINISH OVER THAT GALVANIZED SURFACE MAY EXHIBIT BUMPS, UNEVENNESS, AND MAY NOT BE AS SMOOTH AS THE STANDARD FINISH; THIS UNEVEN AND INCONSISTENT FINISH IS NORMAL FOR GALVANIZING. CONTACT MANUFACTURER FOR DETAILS.
6. ALL SPECIFICATIONS ARE SUBJECT TO CHANGE. CONTACT MANUFACTURER FOR DETAILS.
7. THIS PRODUCT IS SHIPPED PARTIALLY UNASSEMBLED.



EVA-23-F

REVERIE

SPECIAL

EVA BENCH WITH STEEL SLATS  
SHOWN: SPECIAL 6-FOOT LENGTH  
SPECIAL STEEL SLAT CONSTRUCTION

# BISTRO



SEATS - dining height

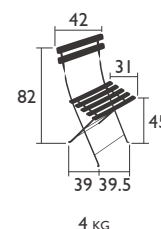


## 5001 - CLASSIQUE CHAIR

Steel frame  
Curved lacquered natural beech slats  
Plastic clips for slow, safe folding and unfolding  
Electro-galvanized one-piece steel cross-beams  
Available in 2 colours

○ 01 Cotton White ● 02 Cedar Green

Accessories: Bistro Basics cushion p. 123

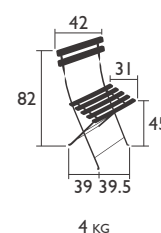


## 6301 - DURAFLON® CHAIR

Steel frame  
High-quality Duraflon® resin curved slats  
Plastic clips for slow, safe folding and unfolding  
Electro-galvanized one-piece steel cross-beams  
Available in 2 colours

○ 01 Cotton White ● 02 Cedar Green

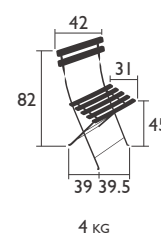
Accessories: Bistro Basics cushion p. 123



## 5107 - NATUREL CHAIR

Steel frame  
Natural beech curved slats, treated with Textrol®  
Plastic clips for slow, safe folding and unfolding  
Electro-galvanized one-piece steel cross-beams

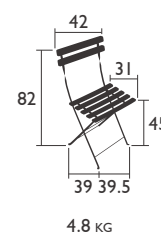
Accessories: Bistro Basics cushion p. 123



## 0101 - METAL CHAIR

Steel frame  
Curved slats made from galvanised steel  
Plastic clips for slow, safe folding and unfolding  
Electro-galvanized one-piece steel cross-beams

Accessories: Bistro Basics cushion p. 123





landscapeforms®



verona™





A perfect balance of style and strength, Verona is an excellent chair for interior or exterior use. Sturdy, yet easily moved, this Robert Chipman-designed chair is also stackable for simple, easy storage.



## Our Purpose Is To Enrich Outdoor Spaces

We believe in the power of design and its ability to influence and elevate the quality of public space. High quality products and outstanding customer experience makes us one of the world's premier designers and manufacturers of outdoor commercial furnishings.

## Verona™ Specifications

Frame is 3/4" tubular steel. Dimensions are 25" deep, and 30" tall. Width is 20" without arms, 23" with arms. Seat height is 17". Seat insert may be specified in metal grid or perforated metal.



chair



chair with armrests

25" x 20" x 30"

25" x 23" x 30"

d x w x h



Perforated metal seats are securely welded to the frame and all metal parts are finished with Landscape Forms' exclusive Pangard II® polyester powdercoat.



Grid metal seats are securely welded to the frame and all metal parts are finished with Landscape Forms' exclusive Pangard II® polyester powdercoat.

## Finishes

All metal parts are finished with Landscape Forms' propriety Pangard II® polyester powdercoat, a hard yet flexible finish that resists rusting, chipping, peeling and fading. Call for standard color chart.

## To Specify

Select Verona chair with or without armrests. Choose seat inset: metal grid or perforated metal. Choose powdercoat color for metal. Chairs are stackable.

## www.landscapiforms.com

Download product photos, brochures, color charts, SketchUp components, Technical information, CAD details, CSI Specifications, Assembly Instructions.

## Verona chairs meet ANSI/BIFMA performance and safety standards.

Verona chairs are designed by Robert Chipman, ASLA. Specifications are subject to change without notice. Verona chairs are manufactured in U.S.A. Landscape Forms supports the LAF at the Second Century level. ©2007 Landscape Forms, Inc. Printed in U.S.A.

## landscapiforms®

800.521.2546 269.381.3455 fax  
431 Lawndale Ave., Kalamazoo, MI 49048  
www.landscapiforms.com



Metal is the world's most recycled material and is fully recyclable. Powdercoat finish on metal parts contains no heavy metals, is HAPS-free and has extremely low VOCs. Consult our website for recycled content for this product.



7800 E. Michigan Ave.  
Kalamazoo, Michigan 49048  
Phone: (800) 521-2546  
Fax: (269) 381-3455  
www.landscapeforms.com  
specify@landscapeforms.com

## Parc Centre Table Product Guide Specification

**Specifier Notes:** This product guide specification is written according to the Construction Specifications Institute (CSI) 3-Part Format, including *MasterFormat*, *SectionFormat*, and *PageFormat*, as described in *The Project Resource Manual—CSI Manual of Practice, Fifth Edition*.

The section must be carefully reviewed and edited by the Architect to meet the requirements of the project and local building code. Coordinate this section with other specification sections and the Drawings. Delete all "Specifier Notes" after editing this section.

Section numbers are from *MasterFormat 2010 Edition*.

### SECTION 12 93 43.53 SITE SEATING AND TABLES

**Specifier Notes:** This section covers Landscape Forms, Inc. "Parc Centre ®" tables. Consult Landscape Forms, Inc. for assistance in editing this section for the specific application.

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

A. Tables.

##### 1.2 REFERENCES

**Specifier Notes:** List standards referenced in this section, complete with designations and titles. Delete standards not included in the edited section. This article does not require compliance with standards, but is merely a listing of those used.

##### A. ASTM Testing Standards:

1. ASTM B 117 – Standard Practice for Operating Salt Spray (Fog) Apparatus.
2. ASTM D 522 – Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings.
3. ASTM D 523 – Standard Test Method for Specular Gloss.
4. ASTM D 2247 – Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
5. ASTM D 2794 – Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
6. ASTM D 3359 – Standard Test Methods for Measuring Adhesion by Tape Test.
7. ASTM D 3363 – Standard Test Method for Film Hardness by Pencil Test.
8. ASTM G 155 – Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials.

##### B. ISO Testing Standards:

1. ISO 1520 – Paints and Varnishes – Cupping Test.
2. ISO 2815 – Paints and Varnishes – Buchholz Indentation Test.

### 1.3 **SUBMITTALS**

- A. **Product Data**: Submit manufacturer's product data, storage and handling requirements and recommendations, installation methods and available colors, styles, patterns and textures.
- B. **Shop Drawings**: Submit manufacturer's shop drawings, including plans and elevations, indicating overall dimensions.
- C. **Samples**: Submit manufacturer's samples of materials, finishes, and colors.
- D. **Warranty**: Manufacturer's standard warranty.

### 1.4 **QUALITY ASSURANCE**

- A. **Manufacturer's Qualifications**: Manufacturer regularly engaged in manufacture of site furnishings since 1969.
- B. **Product Support**: Products are supported with complete engineering drawings and design patents.
- C. **Base Worth**: An installed base of products worth in excess of one hundred million dollars.
- D. **Assets**: Excess of twenty million dollars in assets.
- E. **Production**: Orders are filled within a 40-day schedule.
- F. **Facility Operator**: Welders and machine operators are certified.

### 1.5 **DELIVERY, STORAGE, AND HANDLING**

- A. **Delivery**: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. **Storage**: Store materials in clean, dry area in accordance with manufacturer's instructions. Keep materials in manufacturer's original, unopened containers and packaging until installation.
- C. **Handling**: Protect materials and finish during handling and installation to prevent damage.

### 1.6 **WARRANTY**

- A. **Warranty Information**:
  - Products will be free from defects in material and/or workmanship for a period of three years from the date of invoice.
  - The warranty does not apply to damage resulting from accident, alteration, misuse, tampering, negligence, or abuse.
  - Landscape Forms, Inc. shall, at its option, repair, replace, or refund the purchase price of any items found defective upon inspection by an authorized Landscape Forms service representative.
  - Purchasers should be aware that normal use of these high quality products can result in superficial damage affecting the finish. Scratches, nicks, and dents are to be considered normal wear and tear, and are not the responsibility of the manufacturer.

## **PART 2 PRODUCTS**

### 2.1 **MANUFACTURER**

- A. Landscape Forms, Inc., 7800 E. Michigan Ave, Kalamazoo, Michigan 49048.  
Phone: (800) 521-2546. Fax (269) 381-3455. Website [www.landscapeforms.com](http://www.landscapeforms.com)  
E-mail: [specify@landscapeforms.com](mailto:specify@landscapeforms.com)

### 2.2 **TABLES**

- A. **"Parc Centre" Tables**
- B. **Style**:

|   |
|---|
| Specifier Notes: Specify style & size of table top. |
|---|

1. Square:

- Square: 28 inches.
- 2. Round:
  - a. Diameter: 24 inches.
  - b. Diameter: 30 inches.
- C. Size:
  - 1. Height: 29-1/2 inches.

Specifier Notes: Specify mounting of tables.

- D. Mounting:
  - 1. Surface mounted.
  - 2. Free standing with adjustable levelers.

## 2.3 **MATERIALS**

- A. Table Top: Table tops are made from solid 5/16 steel plate welded to the table support.
- B. Table Support: 2-1/2" outer diameter x 0.120" wall steel tubing. Base plate 17" outer diameter x 0.375" steel.

## 2.4 **ACCESSORIES**

Specifier Notes: Specify anchor bolts for surface-mounted tables. Delete for free-standing tables.

- A. Anchor Bolts: Corrosion resistant recommended, not supplied by the manufacturer.

## 2.5 **RECYCLED CONTENT**

- A. Parc Centre Table:
  - Recycled Material Content: Minimum 90.7 percent.
  - Post-Consumer Material Content: Minimum 58.9 percent.
  - Pre-Consumer Material Content: Minimum 31.8 percent.
  - Recyclable: 100 percent.

## 2.6 **FINISHES**

- A. Finish on Carbon Steel: Landscape Forms, Inc. "Pangard II".
  - 1. Primer: Rust inhibitor.
  - 2. Topcoat: Thermosetting polyester powdercoat. UV, chip, and flake resistant.
  - 3. Test Results: "Pangard II".
    - a. Gloss, Garner 60 Degrees, ASTM D 523: Plus or minus 5.
    - b. UV Resistance, Color and Gloss, ASTM G 155, Cycle 7: Delta E less than 2 at 2.0 mils and less than 20 percent loss.
    - c. Cross-Hatch Adhesion, ASTM D 3359, Method B: 100 percent pass.
    - d. Flexibility Test, Mandrel, ASTM D 522: 3 mm at 2 mils.
    - e. Erichsen Cupping, ISO 1520: 8 mm.
    - f. Impression Hardness, Buchholz, ISO 2815: 95.
    - g. Impact Test, ASTM D 2794: 60 inches/pound at 2.5 mils.
    - h. Pencil Hardness, ASTM D 3363: 2H minimum.
    - i. Corrosion Resistance, 1,500-Hour Test, ASTM B 117: Max undercutting 1 mm.
    - j. Humidity Resistance, 1,500-Hour Test, ASTM D 2247: Max blisters 1 mm.

Specifier Notes: Specify color of metal finish. Consult Landscape Forms, Inc. for selection of standard colors and availability of custom colors.

- 4. Color: \_\_\_\_\_ .



## **PART 3 EXECUTION**

Specifier Notes: Edit Part 3 Execution if tables are to be free standing and not surface mounted.

### **3.1 EXAMINATION**

- A. Examine areas to receive tables.
- B. Notify Architect of conditions that would adversely affect installation or subsequent use.
- C. Do not begin installation until unacceptable conditions are corrected.

### **3.2 INSTALLATION**

- A. Install tables in accordance with manufacturer's instructions at locations indicated on the Drawings.
- B. Install tables plumb and level.
- C. Anchor tables securely in place.

### **3.3 ADJUSTING**

- A. Finish Damage: Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.
- B. Component Damage: Remove and replace damaged components that cannot be successfully repaired as determined by Architect.

### **3.4 CLEANING**

- A. Clean tables promptly after installation in accordance with manufacturer's instructions.
- B. Do not use harsh cleaning materials or methods that could damage finish.

### **3.5 PROTECTION**

- A. Protect installed tables to ensure that, except for normal weathering, tables will be without damage or deterioration at time of Substantial Completion.

**END OF SECTION**

# Instructions

Assembly  
Installation  
Operation

7/2007

## Parc Centre™ Tables

### Product Assembly:

All Parc Centre™ tables are shipped fully assembled, no assembly is required

**WARNING! TO AVOID INJURY TO PERSONS HANDLING TABLES, USE TWO PERSONS TO TEAM LIFT AND CARRY.**

**HANDLE WITH CARE!** Pangard II® Polyester Powdercoat is a strong, long-lasting finish. To protect this finish during assembly, place unwrapped powdercoated parts on packaging foam or other non-marring surface. Do not place or slide powdercoated parts on cement or other hard or textured surface – this will damage the finish causing rust to occur. Use touch-up paint on any gouges in the finish caused by assembly tools.

### Recommended Procedures for Mounting to Hard-Surfacing:

**NOTE:** The anchoring procedure and hardware are the responsibility of the installer, we suggest the following:

#### Freestanding Table Procedure:

1. Place table in desired position.
2. Adjust levelers on glides to level table. All 4 glides must be touching the mounting surface to provide a stable table.

#### Surface Mounting Procedure:

1. Place table in desired position and rotation.
2. Mark hole locations through holes in base.
3. Move unit to a low access for drilling holes.
4. Drill holes at marked position for appropriate anchors. Note: Anchors must be no larger than 3/8" diameter. Non-corrosive anchoring hardware is recommended.
5. Although anchoring procedure and hardware is the responsibility of the installer, Landscape Forms suggests the following:
  - Poured concrete: 3/8" diameter, stud type expansion anchor, minimum of 2-1/2" long.
  - Pavers: If pavers are installed over poured concrete, use 3/8" diameter, stud type expansion anchor with enough length to go through brick and into concrete.
  - Wood deck (at least 2" nominal thickness): 3/8" diameter hex head lag bolt, at least 2-1/2" long.
6. If using expansion anchors, install anchor leaving approximately 1/2" thread protruding from the table base. Place table in position, install hex nut with washer and tighten gently to prevent marring finish.
7. If using lag bolts, place table in position and install lag with washer. Tighten gently to prevent marring finish.



## THE ARC

The Arc rack, a sleek,  
modern curve that  
won't overwhelm other  
architectural elements.

### CONSTRUCTION/MATERIAL

- 1.50" Steel Tubing
- 4" Steel Flanges

### DIMENSIONS

- 29.5" Length
- 4" Width
- 32" Height

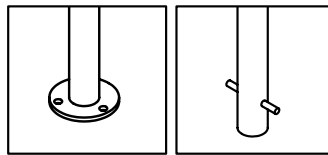
### MOUNTING OPTIONS

- ☐ Flange Mount (Shown)  
(6) .5" Mounting Holes
- ☐ In-Ground  
11" Leg Extensions

### FINISH OPTIONS

- ☐ T304 Stainless Steel  
#4 Satin Finish
- ☐ Hot Dipped Galvanized
- ☐ Powder Coating  
# \_\_\_\_\_
- ☐ Thermoplastic Coating  
# \_\_\_\_\_

Flange or In-Ground



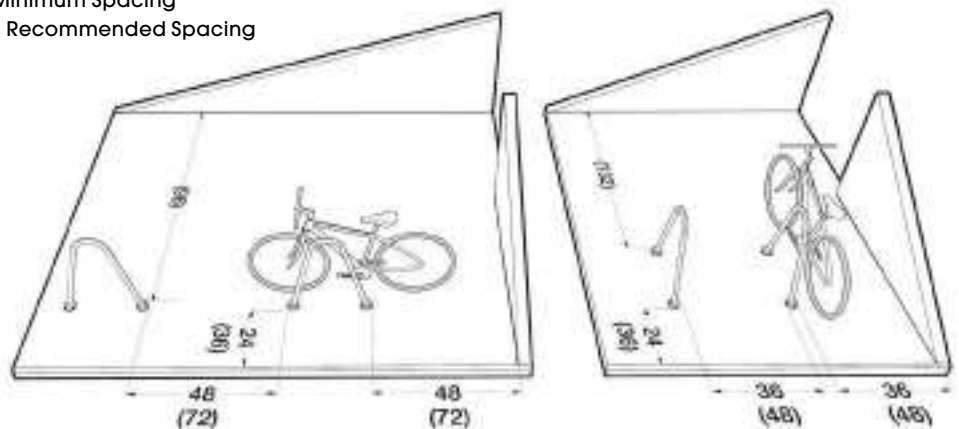
### RECOMMENDED LAYOUT

#### NOTES:

"Bike" is 70"

# Minimum Spacing

(#) Recommended Spacing



#### CONTRACTOR:

#### JOB:

#### NOTES:

# DOWNTOWN RACK



## Security Is So Square

The Downtown Rack uses thick, square-tube construction that can't be cut with a pipe cutter. The extended width of the Downtown Rack makes for easy bike parking by giving the bike full support and multiple locking points for a u-style bike lock.



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A PLAYCORE Company



# DOWNTOWN RACK

## YOUR LOGO HERE

Customize the Downtown Rack and brand your bike parking



## FINISH OPTIONS

Galvanized



Stainless



PVC Dip



## Powder Coat

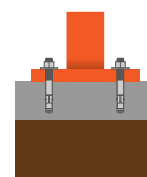
|                         |                    |                         |                      |                          |
|-------------------------|--------------------|-------------------------|----------------------|--------------------------|
| White                   | Black              | Light Gray<br>RAL 7042  | Deep Red<br>RAL 3003 | Yellow<br>RAL 1023       |
| CNH Bright Yellow       | Orange<br>RAL 2004 | Blue<br>RAL 5005        | Sky Blue<br>RAL 5015 | Hunter Green<br>RAL 6005 |
| Light Green<br>RAL 6018 | Green<br>RAL 6016  | Sepia Brown<br>RAL 8014 | Bronze               | Silver<br>9007           |
| Dark Purple             | Flat Black         | Wine Red<br>RAL 3005    | Beige<br>RAL 1001    | Iron Gray<br>7011        |

## Thermoplastic

|       |       |     |      |      |       |
|-------|-------|-----|------|------|-------|
| Black | Green | Red | Blue | Gray | Brown |
|-------|-------|-----|------|------|-------|

## MOUNT OPTIONS

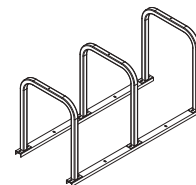
Surface



In-Ground



## Rail



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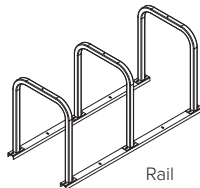
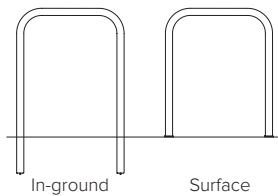
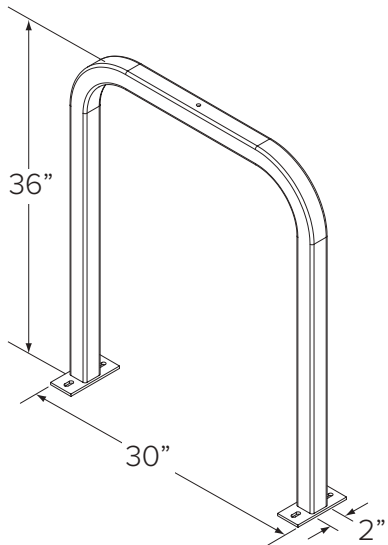


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# DOWNTOWN RACK

## Submittal Sheet



### CAPACITY

2 Bikes

### MATERIALS



#### Standard

2" x 2" x .188" square tube - mild steel

2" x 2" x .120" square tube - stainless steel



#### Lightweight

**\*Powder coat or galvanized only**

2" x 2" x .083" square tube - mild steel

### FINISHES



#### Galvanized

An after fabrication hot dipped galvanized finish is our standard option.



#### Powder Coat

Our powder coat finish assures a high level of adhesion and durability by following these steps:

1. Sandblast
2. Epoxy primer electrostatically applied
3. Final thick TGIC polyester powder coat



#### Thermoplastic

In addition to an increased thickness (8-10mils), the thermoplastic finish covers a galvanized layer and offers superior impact resistance over powder coating.



#### PVC Dip (plastisol)

Other colors available by special order (minimum orders apply)



#### Stainless

Stainless Steel: 304 grade stainless steel material finished in either a high polished shine or a satin finish.

### MOUNT OPTIONS



#### In-ground

In ground mount is embedded into concrete base. Specify in ground mount for this option.



#### Surface

Foot Mount has two 2.5"x6"x.25" feet with two anchors per foot. Specify foot mount for this option.



#### Rail

Rail Mounted Downtown Racks are bolted to two parallel rails which can be left freestanding or anchored to the ground. Rails are heavy duty 3"x1.4"x3/16" thick galvanized mounting rails. Specify rail mount for this option.



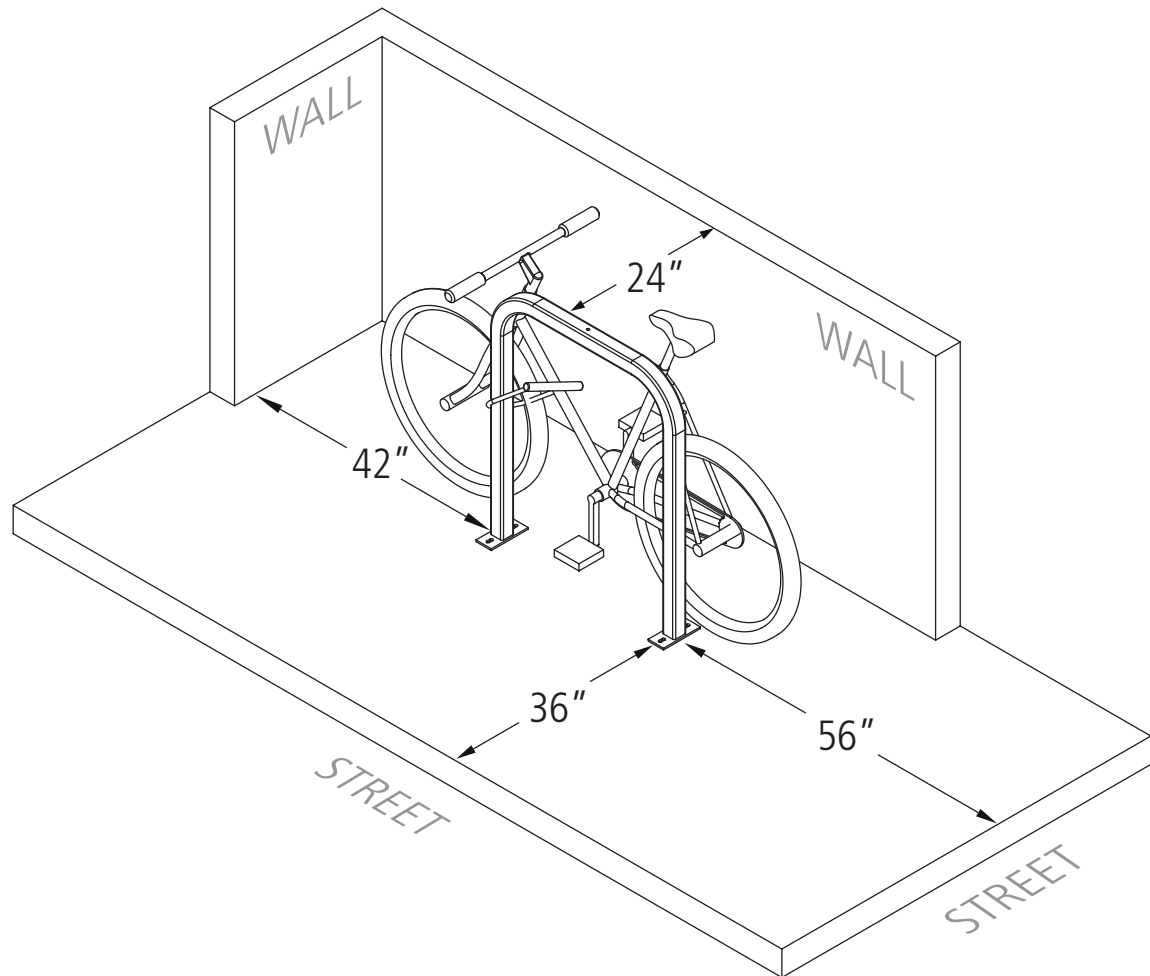
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## DOWNTOWN RACK

### Setbacks

---



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## DOWNTOWN RACK

# Installation Instructions –Surface Mount

---

### TOOLS NEEDED

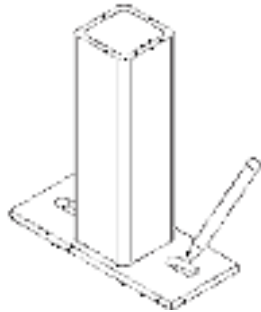
Tape Measure  
Marker or Pencil  
Masonry Drill Bit  
Drill (Hammer drill recommended)  
Hammer  
Wrench 9/16"  
Level

### RECOMMENDED BASE MATERIAL

Solid concrete is the best base material for installation. To ensure the proper anchors are shipped with your rack, ask your Dero Rack representative which anchor is appropriate for your application. Be sure nothing is underneath the base material that could be damaged by drilling.

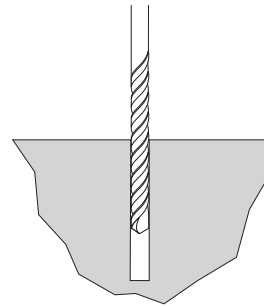
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1



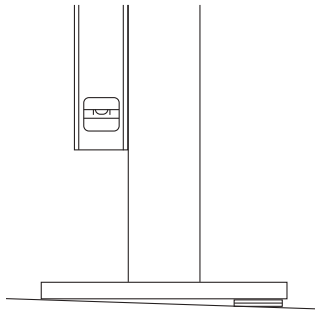
Place the rack in the desired location. Use a marker or pencil to outline the holes of the flange onto the base material.

2



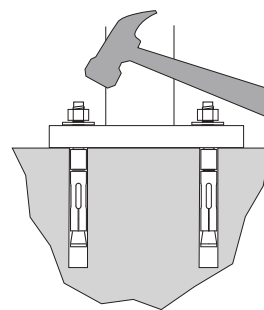
Drill 3/8" diameter holes 3" deep into surface. Make sure the holes are at least 3" away from any cracks in the base material.

3



Place rack (and washers to level rack if necessary) over holes.

4



Thread nuts onto anchors, leaving approximately 1/4" of the anchor protruding, and tap into surface. Tighten nuts down to secure rack.



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## DOWNTOWN RACK

# Installation Instructions – In Ground Mount

### TOOLS NEEDED

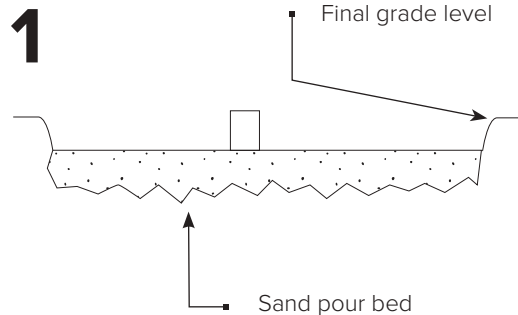
Level  
Cement mixing tub  
Shovel  
Trowel

Hole coring machine with 4" bit  
Access to water hose  
Materials to build brace (see "Install Tip" at bottom of page)

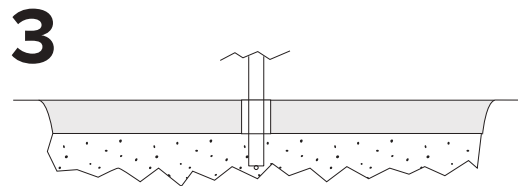
### INSTALLING INTO EXISTING SIDEWALK

Core holes no less than 3" diameter (4" recommended) and 10" deep into sidewalk. Fill holes with Por-Rok or epoxy grout. Place rack into holes, making sure the rack is level. 33"-36" of the rack should remain above the surface. If the rack is less than 33" high, it will not support the bike adequately. Make sure the rack is level and held in place until the grout has set.

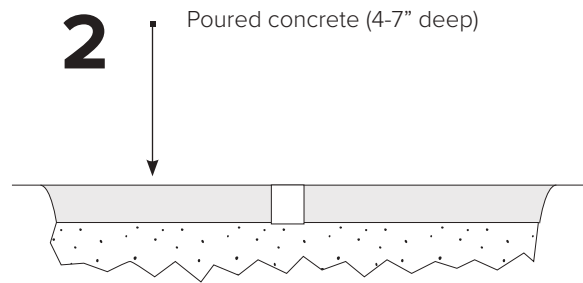
### INSTALLING INTO A NEW SIDEWALK



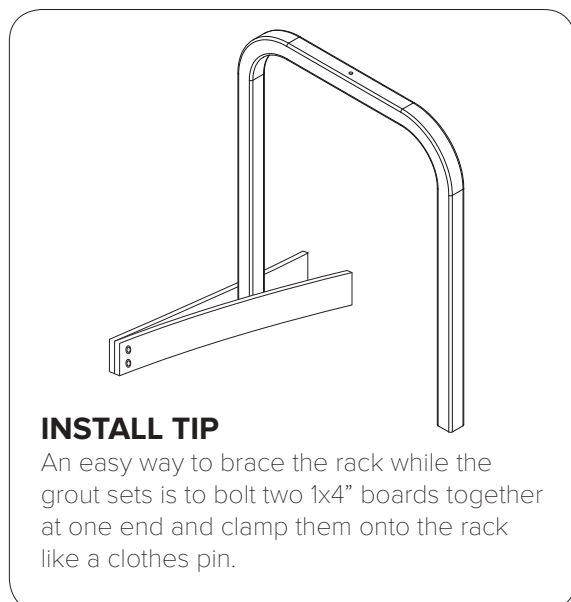
Place corrosion resistant sleeve (min. 3" inside diameter) in sand pour bed in exact location where rack will be installed. Make sure top of sleeve is at same level as desired finished concrete surface. Fill sleeve with sand to keep it in place and prevent it from filling with concrete.



After appropriate cure time, dig out sand from sleeves and insert racks, making sure they are level and at the appropriate height. Pour in Por-Rok or epoxy grout and allow to set.



Pour concrete and allow to cure.



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## DOWNTOWN RACK

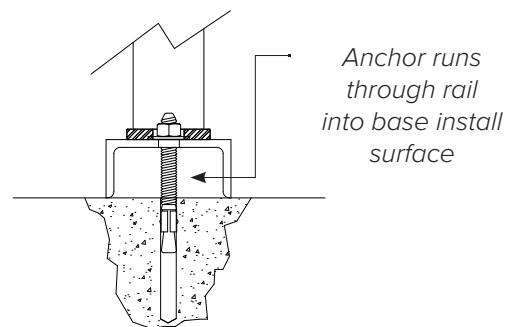
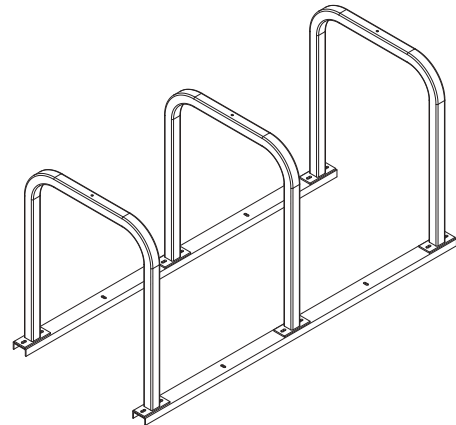
# Rail Mounted Options

### RAIL MOUNTED OPTIONS

Rail mounted Downtown Racks are standard foot mounted Downtown Racks attached with bolts to a rail as in the diagram at left. Rail mounted racks provide more flexibility than other mounting options while providing the same degree of security.

Rail mounted Downtown Racks can be left freestanding, or they can be anchored to the ground using several anchors. This option allows for easier snow removal and sweeping. Installation of Rail mounted Hoops is also much less expensive than embedding the racks into the ground.

\* Note: Though racks may be painted, the rails will remain with only a galvanized finish

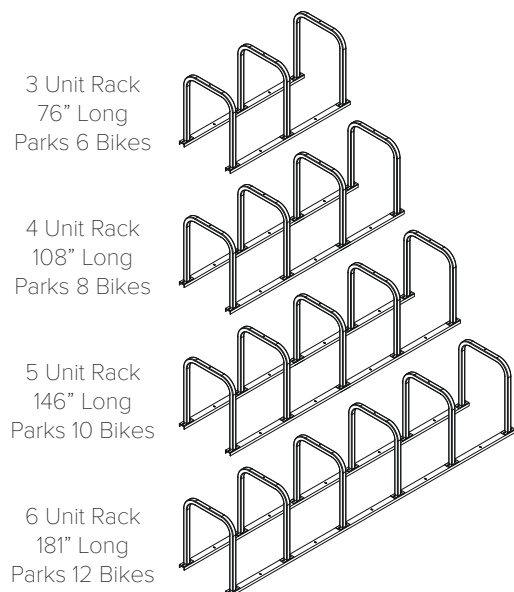


### ADVANTAGES:

- Easier and inexpensive installation
- Can be left freestanding or anchored to the ground
- Easier to remove for sweeping and snow removal

### APPLICATIONS:

- Installation to pavers
- Asphalt Installations
- Ground, dirt, or mulch
- Situations where the rack needs to be moved occasionally



3 Unit Rack  
76" Long  
Parks 6 Bikes

4 Unit Rack  
108" Long  
Parks 8 Bikes

5 Unit Rack  
146" Long  
Parks 10 Bikes

6 Unit Rack  
181" Long  
Parks 12 Bikes



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# BIKE HITCH



## Secure Bike Parking

The Bike Hitch uses thick tube construction and a full radius bend of the ring, making it extremely difficult to cut with a pipe cutter. This popular bike rack has street appeal, a slim silhouette, and accommodates all bike locks.



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# BIKE HITCH

## YOUR LOGO HERE

Customize the Bike Hitch and brand your bike parking



## FINISH OPTIONS

Galvanized



Stainless

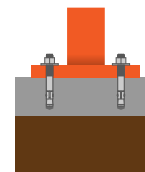


PVC Dip



## MOUNT OPTIONS

Surface



In-Ground



## Powder Coat

|                         |                    |                         |                      |                          |
|-------------------------|--------------------|-------------------------|----------------------|--------------------------|
| White                   | Black              | Light Gray<br>RAL 7042  | Deep Red<br>RAL 3003 | Yellow<br>RAL 1023       |
| CNH Bright Yellow       | Orange<br>RAL 2004 | Blue<br>RAL 5005        | Sky Blue<br>RAL 5015 | Hunter Green<br>RAL 6005 |
| Light Green<br>RAL 6018 | Green<br>RAL 6016  | Sepia Brown<br>RAL 8014 | Bronze               | Silver<br>9007           |
| Dark Purple             | Flat Black         | Wine Red<br>RAL 3005    | Beige<br>RAL 1001    | Iron Gray<br>7011        |

## Thermoplastic

|       |       |     |      |      |       |
|-------|-------|-----|------|------|-------|
| Black | Green | Red | Blue | Gray | Brown |
|-------|-------|-----|------|------|-------|

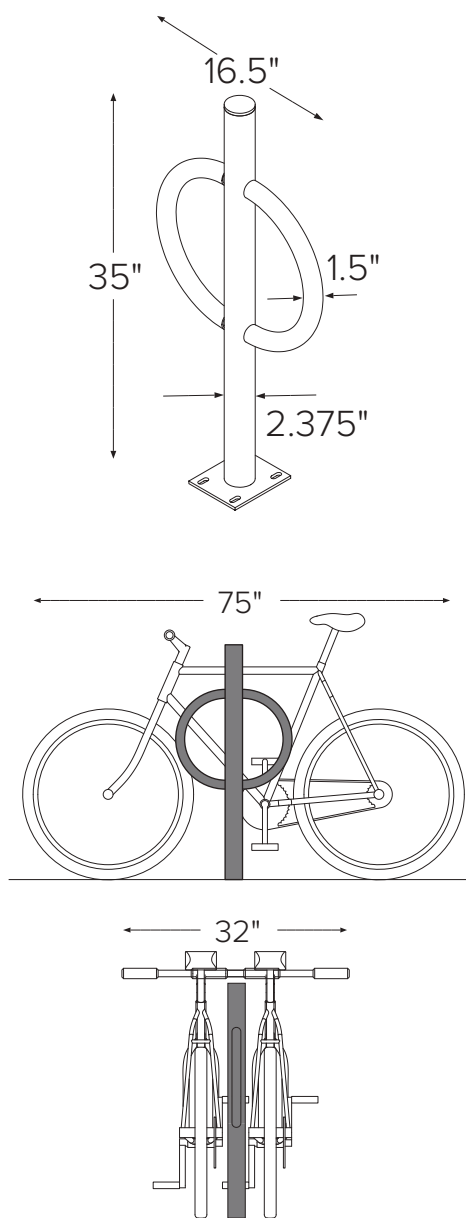
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# BIKE HITCH

## Submittal Sheet



**CAPACITY** 2 Bikes

**MATERIALS** ☐ **Standard**  
Centerbeam: 2" schedule 40 pipe (2.375" OD)  
Ring: 1.5" OD 11 gauge tube

☐ **Lightweight**  
**\*Powder coat or galvanized only**  
Centerbeam: 2" schedule 10 pipe (2.375" OD)  
Ring: 1.5" OD 11 gauge tube

**FINISHES** ☐ **Galvanized**  
An after fabrication hot dipped galvanized finish is our standard option.

☐ **Powder Coat**  
Our powder coat finish assures a high level of adhesion and durability by following these steps:  
1. Sandblast  
2. Epoxy primer electrostatically applied  
3. Final thick TGIC polyester powder coat

☐ **Thermoplastic**  
In addition to an increased thickness (8-10mils), the thermoplastic finish covers a galvanized layer and offers superior impact resistance over powder coating.

☐ **PVC Dip** (plastisol)  
Other colors available by special order (minimum orders apply)

☐ **Stainless**  
Stainless Steel: 304 grade stainless steel material finished in either a high polished shine or a satin finish.

**MOUNT OPTIONS** ☐ **In-ground**  
In ground mount is embedded into concrete base. Specify in ground mount for this option.

☐ **Surface**  
Foot Mount has a 5"x6"x.25" foot with four anchors per foot. Specify foot mount for this option.



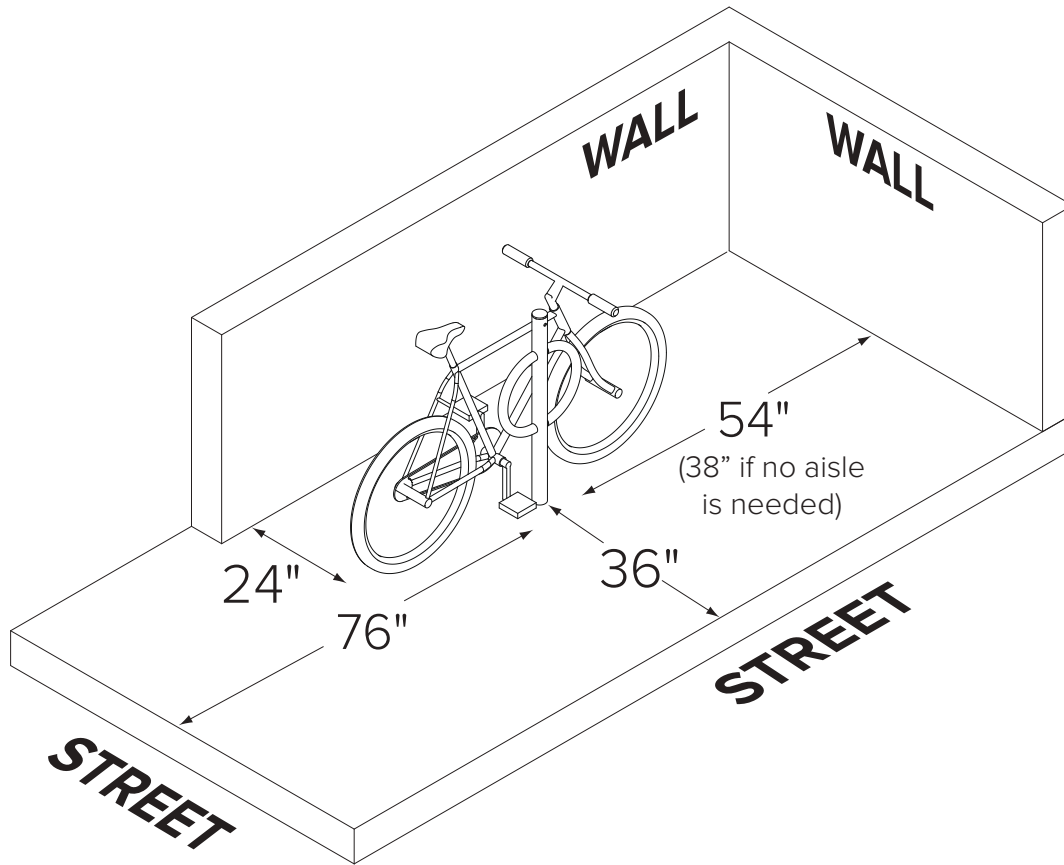
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## BIKE HITCH Setbacks

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## BIKE HITCH

# Installation Instructions – Surface Mount

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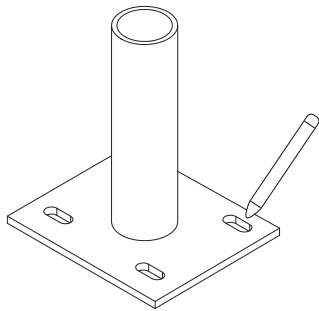
### TOOLS NEEDED

Tape Measure  
Marker or Pencil  
Masonry Drill Bit  
Drill (Hammer drill recommended)  
Hammer  
Wrench 9/16"  
Level  
Washers (for leveling if necessary)

### RECOMMENDED BASE MATERIAL

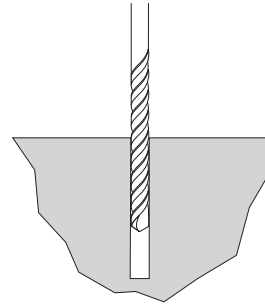
Solid concrete is the best base material for installation. To ensure the proper anchors are shipped with your rack, ask your Dero Rack representative which anchor is appropriate for your application. Be sure nothing is underneath the base material that could be damaged by drilling.

1



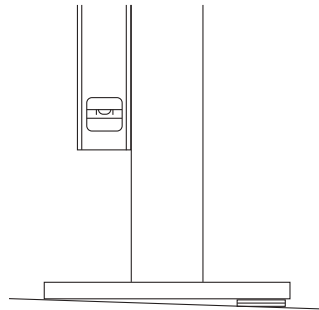
Place the rack in the desired location. Use a marker or pencil to outline the holes of the flange onto the base material.

2



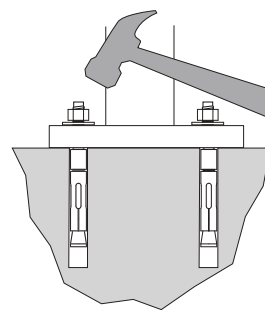
Drill 3/8" diameter holes 3" deep into surface. Make sure the holes are at least 3" away from any cracks in the base material.

3



Place rack (and washers to level rack if necessary) over holes.

4



Thread nuts onto anchors, leaving approximately 1/4" of the anchor protruding, and tap into surface. Tighten nuts down to secure rack.



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## BIKE HITCH

# Installation Instructions – In Ground Mount

### TOOLS NEEDED

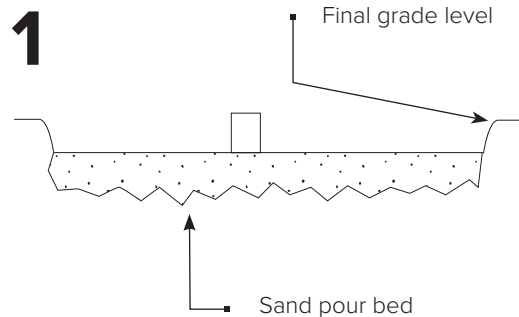
Level  
Cement mixing tub  
Shovel  
Trowel

Hole coring machine with 4" bit  
Access to water hose  
Materials to build brace (see "Install Tip" at bottom of page)

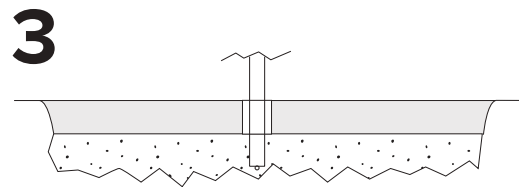
### INSTALLING INTO EXISTING SIDEWALK

Core holes no less than 3" diameter (4" recommended) and 10" deep into sidewalk. Fill holes with Por-Rok or epoxy grout. Place rack into holes, making sure the rack is level. 33"-36" of the rack should remain above the surface. If the rack is less than 33" high, it will not support the bike adequately. Make sure the rack is level and held in place until the grout has set.

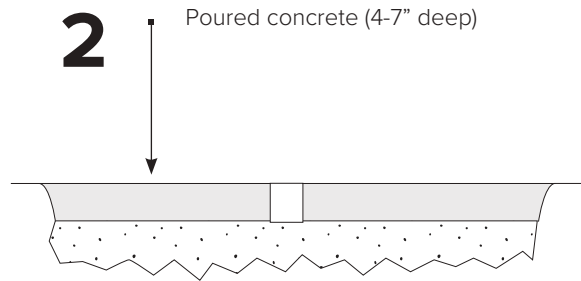
### INSTALLING INTO A NEW SIDEWALK



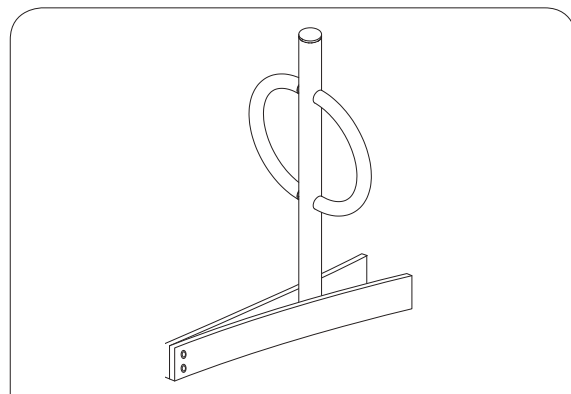
Place corrosion resistant sleeve (min. 3" inside diameter) in sand pour bed in exact location where rack will be installed. Make sure top of sleeve is at same level as desired finished concrete surface. Fill sleeve with sand to keep it in place and prevent it from filling with concrete.



After appropriate cure time, dig out sand from sleeves and insert racks, making sure they are level and at the appropriate height. Pour in Por-Rok or epoxy grout and allow to set.



Pour concrete and allow to cure.



#### INSTALL TIP

An easy way to brace the rack while the grout sets is to bolt two 1x4" boards together at one end and clamp them onto the rack like a clothes pin.



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## No More Wheel Benders

Bicyclists hate old-style “wheel bender” bike racks, the ones where you wedge your wheel between the bars and can’t use a U-lock. We hate them, too! That’s why we made the U-LOCKIT™ — a small, modular, affordable rack that actually does what bike racks are supposed to do: secure your bike with any lock. Perfect for smaller applications and short-term parking at schools, churches, and small businesses.

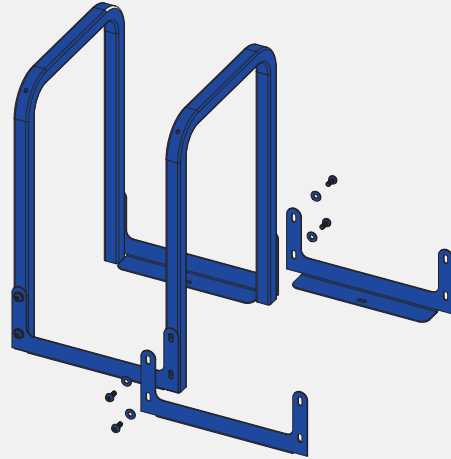
*Patent 9,592,868 B2*



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## ADD ON AS NEEDED

Individual U-Lockit™ arms bolt together so you can order just the amount you need, and it's easy to add more later.



## FINISH OPTIONS

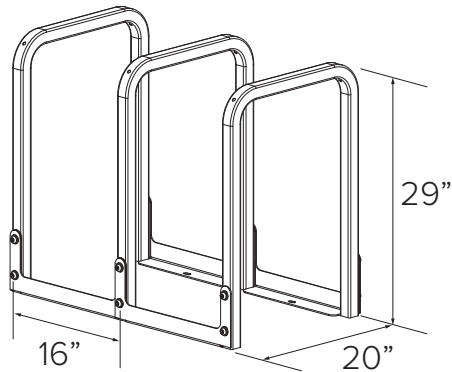
Galvanized



Powder Coat





**CAPACITY**

2 Bikes per hoop  
3 hoop minimum for stability

**MATERIALS**

Hoop: 1.5" 16g sq. tube  
Connectors: 11g plate

**FINISHES****Powder Coat**

Our powder coat finish assures a high level of adhesion and durability by following these steps:

1. Sandblast
2. Epoxy primer electrostatically applied
3. Final thick TGIC polyester powder coat

**Galvanized**

An after fabrication hot dipped galvanized finish is our standard option.

**MOUNT OPTIONS****Surface**

All connections and mounting parts have pre-threaded mounting holes (except the feet). No drilling or tapping required.



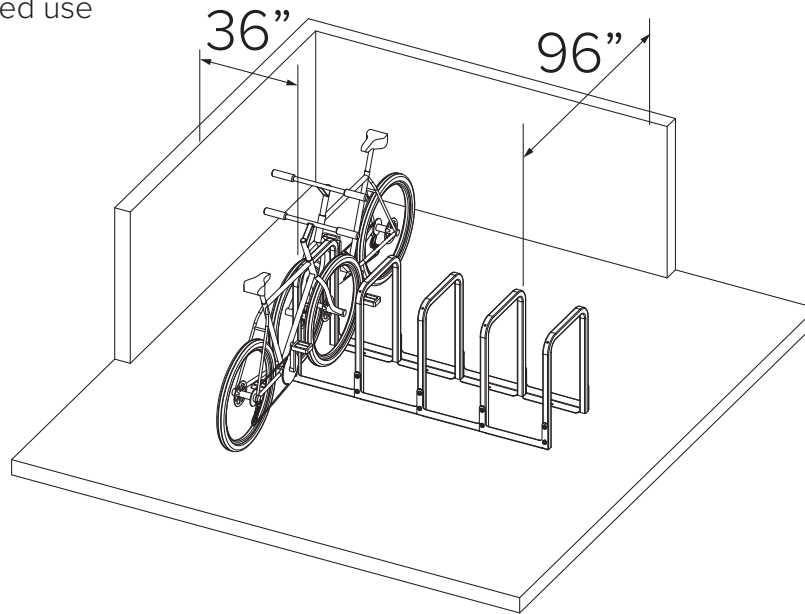
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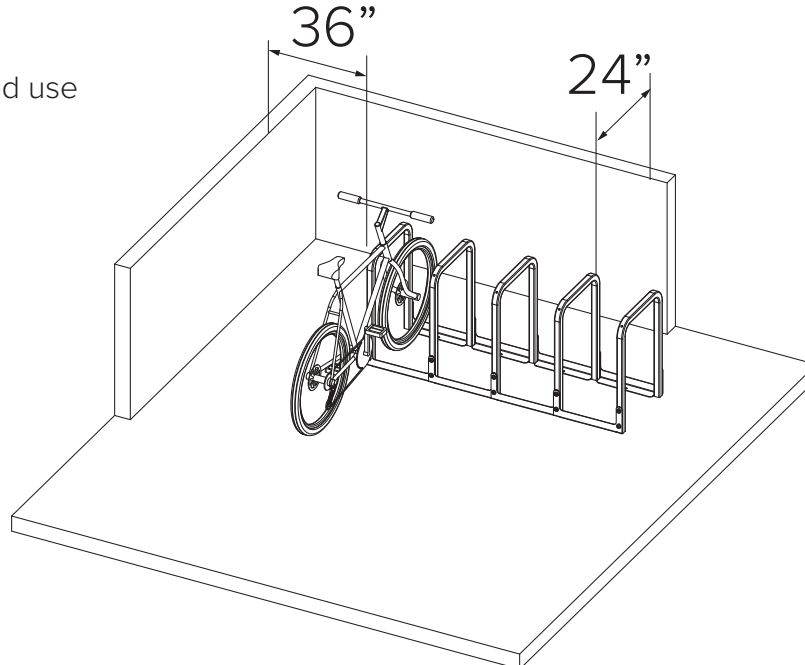
# U-LOCKIT™ Setbacks

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Double sided use



Single sided use

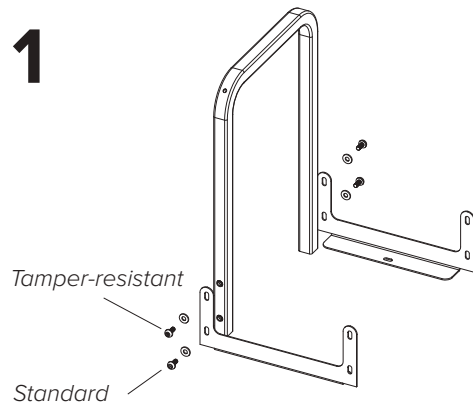


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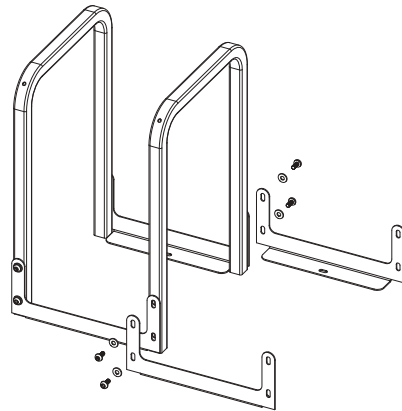
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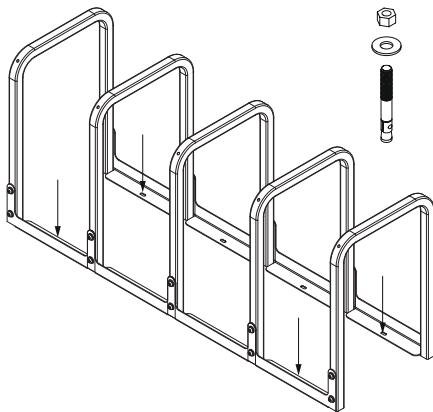
# Installation Instructions

**1**

Place the rack in the desired location. Use a marker or pencil to outline the holes of the flange onto the base material.

**2**

Attach the next hoop and (2) plates with (2) 3/8" x 1" tamper-resistant bolts, (2) 3/8" x 1" bolts, and (4) washers. Continue attaching hoops and plates as needed.

**3**

When assembly is completed, position the assembly and anchor to the ground through the slotted holes in the plates on each end of the run of racks. For longer runs you may also need to add anchors to a middle section.



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# CYCLE STALL ELITE



## Easy Conversion, Rugged Support

The Cycle Stall bike corral turns a standard on-street, car parking stall into protected, bike parking. The Cycle Stall is the first on-street bike parking kit that includes everything needed for the conversion from car to bike parking. The Cycle Stall frame is built from rugged, impact resistant, two inch steel. It provides a physical barrier from traffic while including racks with optimum frame support and security. The Cycle Stall is designed to work in a standard 22' parking stall. Additional sections may be added to extend your on-street bike parking when needed.



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# CYCLE STALL ELITE



## FINISH OPTIONS

Galvanized      Stainless



### Powder Coat

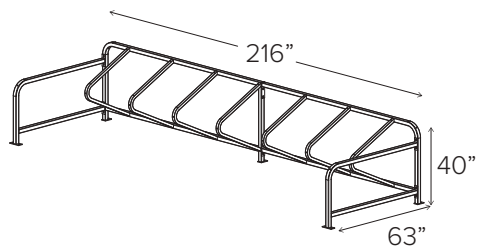
|                         |                    |                         |                      |                          |
|-------------------------|--------------------|-------------------------|----------------------|--------------------------|
| White                   | Black              | Light Gray<br>RAL 7042  | Deep Red<br>RAL 3003 | Yellow<br>RAL 1023       |
| CNH Bright Yellow       | Orange<br>RAL 2004 | Blue<br>RAL 5005        | Sky Blue<br>RAL 5015 | Hunter Green<br>RAL 6005 |
| Light Green<br>RAL 6018 | Green<br>RAL 6016  | Sepia Brown<br>RAL 8014 | Bronze               | Silver<br>9007           |
| Dark Purple             | Flat Black         | Wine Red<br>RAL 3005    | Beige<br>RAL 1001    | Iron Gray<br>7011        |

### Thermoplastic

|       |       |     |      |      |       |
|-------|-------|-----|------|------|-------|
| Black | Green | Red | Blue | Gray | Brown |
|-------|-------|-----|------|------|-------|

# CYCLE STALL ELITE

## Submittal Sheet



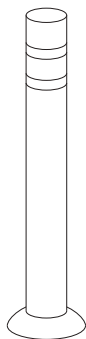
**CAPACITY** 14 Bikes

**MATERIALS** Main body 2" x 1/8" square tube  
Locking bars 1.5" x 1/8" square tube

- FINISHES**
- ☐ **Galvanized**  
An after fabrication hot dipped galvanized finish is our standard option.
  - ☐ **Powder Coat**  
Our powder coat finish assures a high level of adhesion and durability by following these steps:  
1. Sandblast  
2. Epoxy primer electrostatically applied  
3. Final thick TGIC polyester powder coat
  - ☐ **Thermoplastic**  
In addition to an increased thickness (8-10mils), the thermoplastic finish covers a galvanized layer and offers superior impact resistance over powder coating.

- DELINEATORS**
- ☐ **White**
  - ☐ **Yellow**

- MOUNT OPTIONS**
- ☐ **Surface**  
has five 2" wide feet which should be anchored to the ground with supplied anchors



### TRAFFIC DELINEATORS

Five 48" tall traffic delineators are included to protect your installation from damage by vehicles.

The delineators are secured to the ground with an epoxy cement and include two bands of reflective tape for greater visibility in low light.



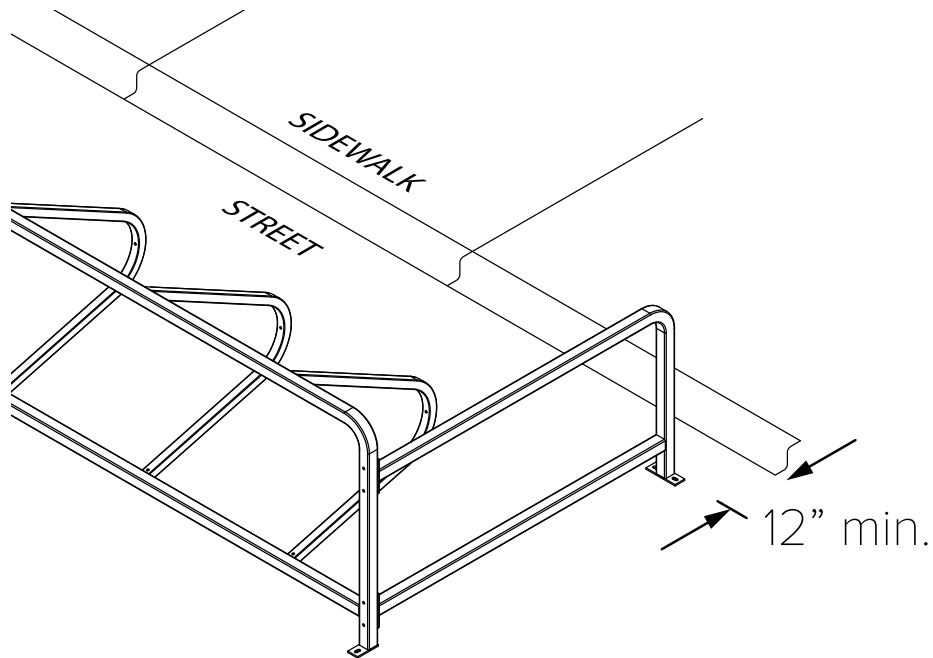
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## CYCLE STALL ELITE

### Setbacks

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*Be sure to check with your local  
municipal codes and laws for on-street  
installation regulations.*



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## CYCLE STALL ELITE

# Installation Instructions

---

### TOOLS NEEDED

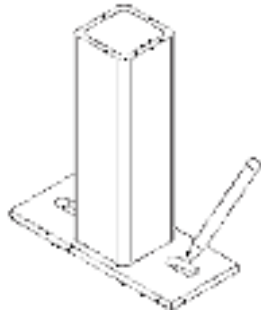
Tape Measure  
Marker or Pencil  
Masonry Drill Bit 3/8"  
Drill (Hammer drill recommended)  
Hammer  
Wrench 9/16"

### RECOMMENDED BASE MATERIAL

A concrete base is the best surface for installation. For installation into asphalt, separate asphalt anchors and instructions will be sent with the rack.

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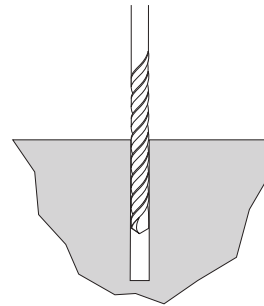
1



Attach the Cycle Stall segments on street with the supplied 3/8" x 2.75" carriage bolts, and move assembled unit into place.

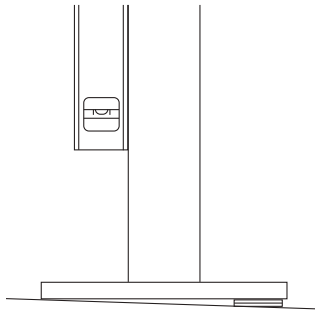
Place the rack in the desired location. Use a marker or pencil to outline the holes of the flange onto the base material.

2



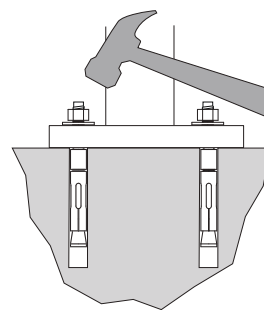
Drill 3/8" diameter holes 3" deep into surface. Make sure the holes are at least 3" away from any cracks in the base material.

3



Place rack (and washers to level rack if necessary) over holes.

4



Thread nuts onto anchors, leaving approximately 1/4" of the anchor protruding, and tap into surface. Tighten nuts down to secure rack.



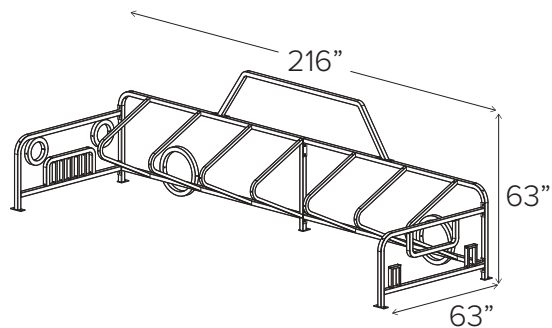
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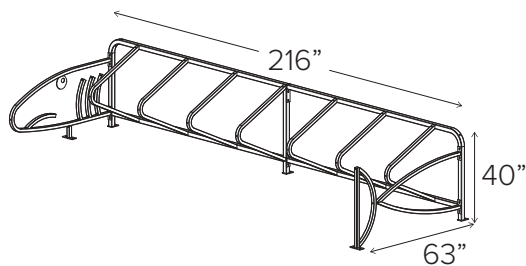
## CYCLE STALL ELITE

### Custom Options

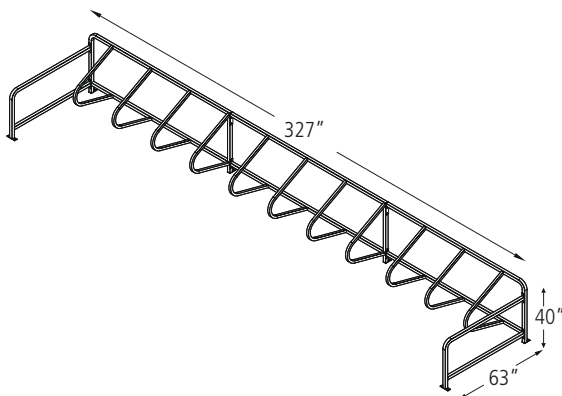
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The optional car kit puts an ironic twist to on-street parking. Unlike the real thing, this vehicle does not produce harmful emissions and instead encourages a healthier, greener way of getting around town.



Lure bicyclists into this safe harbor with the specially designed fish kit. This specialized Cycle Stall would complement any waterside streetscape or aquatic themed organization.

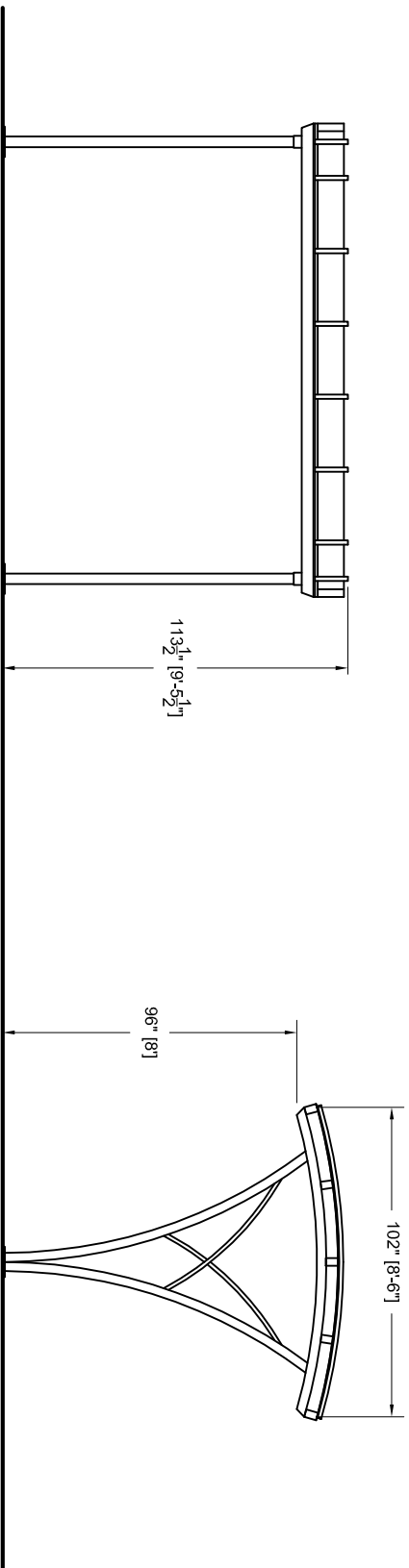


Due to the Cycle Stall's modular design, additional extender units may be ordered where a higher bike parking capacity is required. Each extension adds parking for 8 more bikes.



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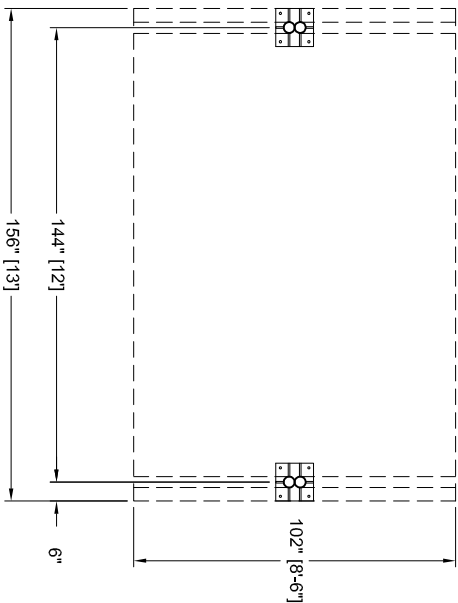
FRONT ELEVATION

END ELEVATION

NOTES:

- Framework to be welded and mechanically fastened steel
- All mechanical connections to be made with concealed fasteners
- Rafter and purlins shall be beveled, then capped, welded and ground smooth prior to finishing
- Base anchor plates shall be stainless steel, grade 304, finished to match shelter
- Roof glazing to be 8MM structural polycarbonate - batten system
- See section 10 72 4.3 for detailed written specifications
- Design is preliminary, conceptual, and subject to change based on final engineering phase and customer approval

- AVAILABLE IN CUSTOM SIZES - PLEASE CONSULT DUO-GARD INDUSTRIES



PLAN VIEW

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LEAD TIME BEGINS UPON RECEIPT OF SIGNED SHOP DRAWINGS

APPROVAL SIGNATURE

DATE

X

PROJECT NAME

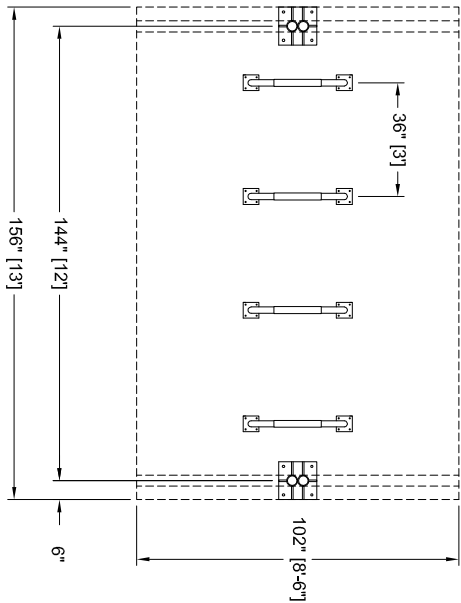
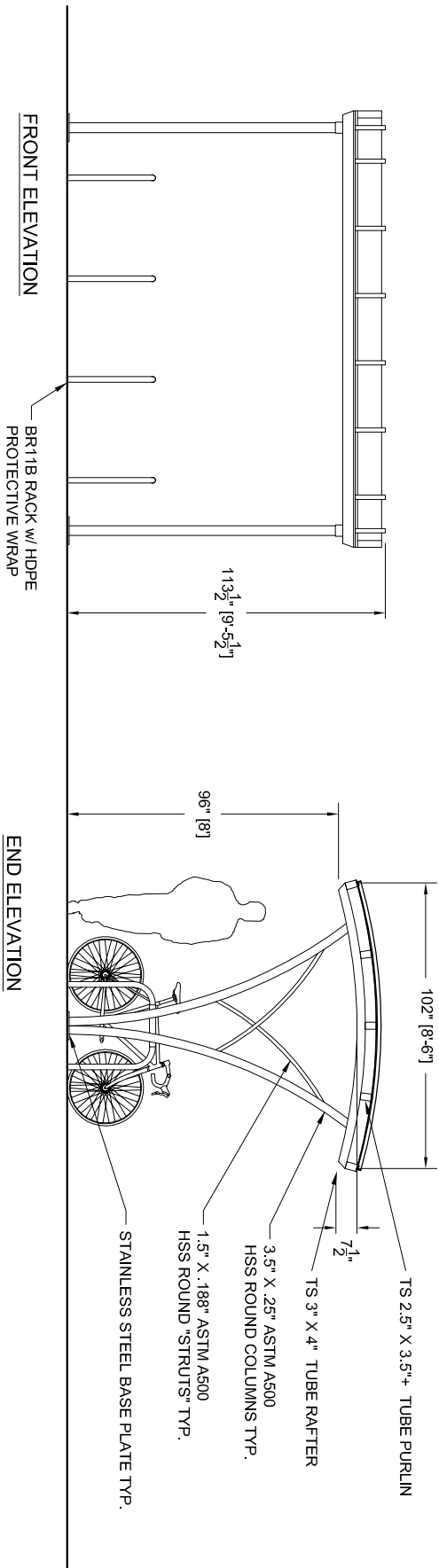
CUSTOMER SAMPLE

DESCRIPTION

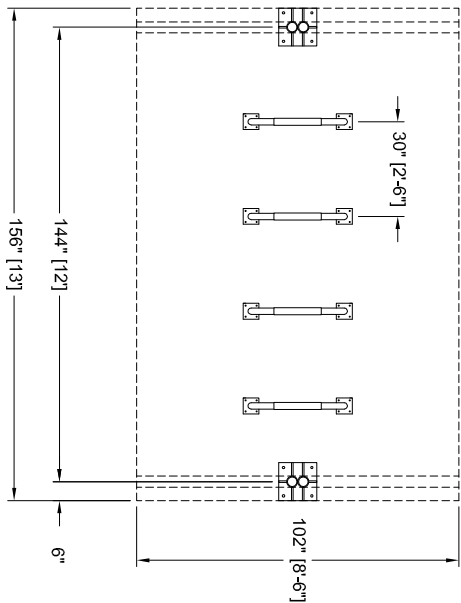
9' X 13' "PARACHUTE" BICYCLE SHELTER

| PRJ/ENG | PRJ/ MGR | DRF/ TR | DRWG DATE | REV1 | REV2 | SCALE | PAGE | OF | DRWG #  |
|---------|----------|---------|-----------|------|------|-------|------|----|---------|
| GS      |          |         | 1.1.2017  |      |      |       | 1    | 1  | 0913PAR |





PLAN VIEW  
36" RACK SPACING



PLAN VIEW  
30" RACK SPACING

- NOTES:
- \*FRAMEWORK TO BE WELDED AND MECHANICALLY FASTENED STEEL
  - \*ALL FASTENERS TO BE STAINLESS STEEL
  - \*ROOF GLAZING TO BE: 8MM POLYCARBONATE STRUCTURED SHEET, BATTEN SYSTEM, IN ALUMINUM TRIM, TINT.
  - \*STEEL FINISHING:
    - \*MEDIA BLAST PREP
    - \*TNEMEC TNEME ZINC 90-97 PRIMER
    - \*TNEMEC SERIES N69 HI-BUILD EPOXOLINE 2-PART EPOXY MIDCOAT.
    - \*TNEMEC SERIES 73 ENDURA-SHIELD TOPCOAT.
    - \*ALUMINUM TRIM TO HAVE SAME TOP TWO COATS.
  - \*COLOR: \_\_\_\_\_
  - \*ALL DIMENSIONS TO BE FIELD VERIFIED
  - \*DESIGN IS PRELIMINARY, AND CONCEPTUAL, AND SUBJECT TO CHANGE BASED ON FINAL ENGINEERING PHASE AND CUSTOMER APPROVAL.

| BIKE CAPACITY |            |            |   |
|---------------|------------|------------|---|
| RACK SPACING  | # OF RACKS | # OF BIKES |   |
| 36"           | 4          | 4          | 8 |
| 30"           | 4          | 4          | 8 |

Duo-Gard Industries, Inc.  
 Tel (734) 207-9700 Fax (734) 207-7995  
 www.duo-gard.com

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**LEAD TIME BEGINS UPON RECEIPT OF SIGNED SHOP DRAWINGS**

APPROVAL SIGNATURE \_\_\_\_\_ DATE \_\_\_\_/\_\_\_\_/\_\_\_\_

X \_\_\_\_\_

PROJECT NAME: \_\_\_\_\_

DESCRIPTION: **9' X 13' "PARACHUTE" BICYCLE SHELTER, PLAN AND ELEVATION DETAILS**

|         |          |         |           |      |      |               |      |    |         |
|---------|----------|---------|-----------|------|------|---------------|------|----|---------|
| PRJ/ENG | PRJ/ MGR | DRF/ TR | DRWG DATE | REV1 | REV2 | SCALE         | PAGE | OF | DRWG #  |
| BDI     | SM       | GS      | 9.1.2016  |      |      | 3/16" = 1'-0" | 1    | 1  | 0913PAR |

## **SECTION 10 73 43 BICYCLE SHELTERS**

### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Bicycle shelter(s) – Parachute Model

#### **1.3 REFERENCES**

- A. ASTM A 1008/A – Standard Specification for Steel Bars, Carbon and Alloy, Cold-Finished.
- B. ASTM B 209 – Standard Specification for Aluminum and Aluminum-alloy Sheet and Plate.
- C. ASTM B 221 – Standard Specification for Aluminum and Aluminum-alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
- D. ASCE 7-05 – Minimum Design Loads for Buildings and Other Structures.
- E. ICC/ANSI A 117.1 – Accessible and Usable Buildings and Facilities.
- F. IBC – International Building Code.
- G. Americans with Disabilities Act of 1990 (ADA). As amended by Public Law 101-336 (2009)
- H. AISC Publications:
  - 1. Code of Standard Practice for Steel Buildings and Bridges.
  - 2. Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings, including Commentary.
  - 3. Structural Welding Code – Steel.

#### **1.4 DESIGN REQUIREMENTS**

- A. Basic Wind Speed: 90 mph. Upgrades available to meet all hurricane zone requirements.
- B. Exposure Category: B: Upgrades available to meet all exposure categories.
- C. Basic Snow Load: 20 psf. Upgrades available to meet all snow load requirements.
- D. Seismic Design – per local codes. Upgrades available to meet any zone requirement.
- E. Column to concrete footing / concrete pad connection to be in compliance with OSHA Steel Erection Standard CFR – which requires a minimum of four (4) anchor bolts per column.
- F. No onsite welding shall be required or permitted.

#### **1.5 SUBMITTALS**

- A. Product Data: Submit manufacturer's product data, including materials, components, finish and all accessories and equipment furnished.
- B. Shop Drawings: Submit manufacturer's shop drawings, including plans, elevations, sections and details, dimensions, anchorage, fasteners and locations, flashing and seal details if applicable,



finish, and options.

- C. Erection Drawings: Submit manufacturer's instructions and drawings, and develop erection procedures to enable field installation and repair.
- D. Manufacturer's Project References: Submit list of completed projects including project name and location and type of shelters manufactured.
- E. Warranty: Submit manufacturer's standard warranty.

## **1.6 QUALITY ASSURANCE**

- A. Manufacturer's Qualifications:
  - 1. Continuously engaged in Steel Shelter manufacturing with a minimum of 10 years successful experience.
  - 2. Able to demonstrate successful performance on comparable projects.
  - 3. Responsible for all components, including structural design.
  - 4. All welding performed by AWS certified welders and inspected by AWS certified inspectors.
- B. Installer's Qualifications:
  - 1. Authorized by manufacturer to install Shelters.
  - 2. Trained by manufacturer' standard training methods and policies.

## **1.7 DELIVERY, STORAGE, AND HANDLING**

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name, manufacturer, and location of installation with detailed written instructions for installation.
- B. Storage: Store materials in a clean, dry area indoors in accordance with manufacturer's instructions.
- C. Inspect for concealed damage within 48 hours of delivery and compare manufacturer's bill of lading / packing list and report any missing items to the manufacturer within this time frame.

## **1.8 WARRANTY**

- A. Warranty Period: One year starting on date of substantial completion.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURER**

- A. "Parachute" model, 9' x 13', by Duo-Gard Industries Inc., 40442 Koppernick Road, Canton, Michigan 48187. Phone (734) 207-9700. Fax (734) 207-7995. Web Site [www.duo-gard.com](http://www.duo-gard.com). E-Mail [info@duo-gard.com](mailto:info@duo-gard.com).
- B. Substitutions must be approved ten (10) days prior to the bid date. Alternate providers must provide complete product drawings as well as proof of equivalency of the pretreatment and Tnemec finish system. Powder coating will not be an acceptable alternative. Please forward complete information, including testing information to meet ASTM requirements, for the alternate requested finishing procedures.

## **2.3 Fabricated Steel Shelters**

- A. Shelters – A pre-engineered and prefabricated framed shelter(s), columns, rafters, purlin structure with roof panels, trim, flashing, fasteners and accessories needed for complete installation.
- B. The shelter glazing trim and associated components shall be fabricated using 6063-T5 extruded aluminum members Fed. Spec. QQ-A-200/9C(1). 6061-T6 and 6005-T6 alloy/temper shall be used where required. Finished to match.
- C. Fasteners:
  - 1. Roof framing, accessories, amenities, wall / roof trim: stainless steel or aluminum.
  - 2. Structural/frame connections: grade 304 or 316 stainless steel.
  - 3. Anchoring: grade 304 or 316 stainless steel wedge anchor bolts or adhesive anchors.
  - 4. Fasteners ¼" dia. and smaller: finished to match at factory (as req'd).
  - 5. Fasteners 5/16" dia. and larger: to remain unfinished in completed product, or painted in field.
  - 6. All connections shall be concealed. No exposed fasteners shall be allowed other than anchor bolts.
- D. Structural framing shall be Hollow Structural Sections (HSS) meeting ASTM A500 grade B.
- E. Steel Roof Rafter and Purlins shall be beveled at a 45 degree angle. The openings shall be capped with steel, welded and ground smooth prior to the finishing process.
- F. Ground anchor plates shall be stainless steel, grade 304, which are welded to the columns in the factory. The anchor plates shall be finished per section 2.5 (A).
- G. Roof sheathing/glazing shall be shall be: translucent polycarbonate structured sheet or standing seam metal (choose one).
  - 1. Translucent polycarbonate structured sheet: 8mm multi-wall polycarbonate sheet. Edges and joints to be trimmed with extruded aluminum glazing system, finished to match. Polycarbonate tint to be: clear, bronze, opal, other: \_\_\_\_\_ (choose).
  - 2. 24 gauge standing seam galvalume steel panels – color to be selected from roof color guide. Aluminum Panels, standard thickness is .032, are available in limited colors.
- H. Joint Sealant:
  - 1. Factory-Applied Sealant: Gunnable, non-hardening, elastomeric sealant. ASTM C 920, Type S, Class 12, Grade NS. Fed Spec TT-S-1657, Type 1.n.
  - 2. Field-Applied Sealant: As approved by the shelter manufacturer.
- I. Field Fasteners:
  - 1. Comply with shelter manufacturer's instructions for fastener types, quantities, and usage. Substitutions are not permitted.
- J. Shelter fabrication and all components must meet Buy America Requirements.

## **2.4 Accessories**

- A. LED Solar Lighting, or grid tied LED lighting, are available as a standard offering. Other types of light fixtures are available. Please contact the manufacturer for additional information.

## **2.5 COLOR AND FINISH**

- A. Steel framework finish shall be:

1. Duo-Gard long-wear paint process:

- a. Media Blast Prep to SSPC-SP10/NACE #2 Near White Blast Cleaned Steel.
- b. Tnemec Tnemec-Zinc 90-97 primer; to meet ASTM D 1014 (Type II) Exterior Exposure and ASTA D 4541 (type II) Adhesion.
- c. Tnemec F.C. Typoxy Series 27 intermediate coat. To meet ASTM D 4060, ASTM D 3359, ASTA D 4585 and ASTM D 1653.
- d. Tnemec series 1075 Endura-Shield II topcoat; To meet requirements of ASTM D4060, ASTM D 3359, ASTM D 4141, ASTM D 522 and ASTM D4585.
- e. Topcoat Color:\_\_\_\_\_.

B. For approved equal requests to Tnemec finish provide the testing data for the requested alternate finish method for the following tests and test results. The requested finish system shall meet or exceed the requirements of the ASTM numbers listed above in 2.5 (A1, items b-d).

- a. ASTM B 117 – Salt spray (Fog) Testing (1,000 hours exposure)
- b. ASTM D 610 – Evaluating Degree of Rusting
- c. ASTM D 1654 – Evaluating Coatings Subjected to Corrosive Environments

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- A. When unloading you will typically need a fork lift, with fork extenders. When uncrating handle all materials carefully to avoid scratching the finish. Note any visible damage on bill of lading. Concealed damage shall be reported to the manufacturer within 48 hours of delivery.
- C. Examine areas to install shelters. Notify Architect of conditions that would adversely affect installation. Do not proceed with installation until unsatisfactory conditions are corrected.

#### **3.2 PREPARATION**

- A. Ensure location to receive shelter is clean, flat, level, plumb, square, accurately aligned, and correctly located.

#### **3.3 INSTALLATION**

- A. The manufacturer shall provide installation instructions complete with diagrams. Installation shall be performed by the manufacturer or his representative (option). The manufacturer shall guarantee the installation for a period of one (1) year, when performed by the manufacturer, from the date of acceptance.

#### **3.4 CLEANING**

- A. Clean shelters in accordance with manufacturer's instructions.
- B. Clean inside and outside of shelters immediately after installation.
- C. Do not use harsh cleaning materials or methods that would damage the metal finish or glazing.

#### **3.5 PROTECTION**

- A. Protect installed shelters from damage during construction.

**END OF SECTION**



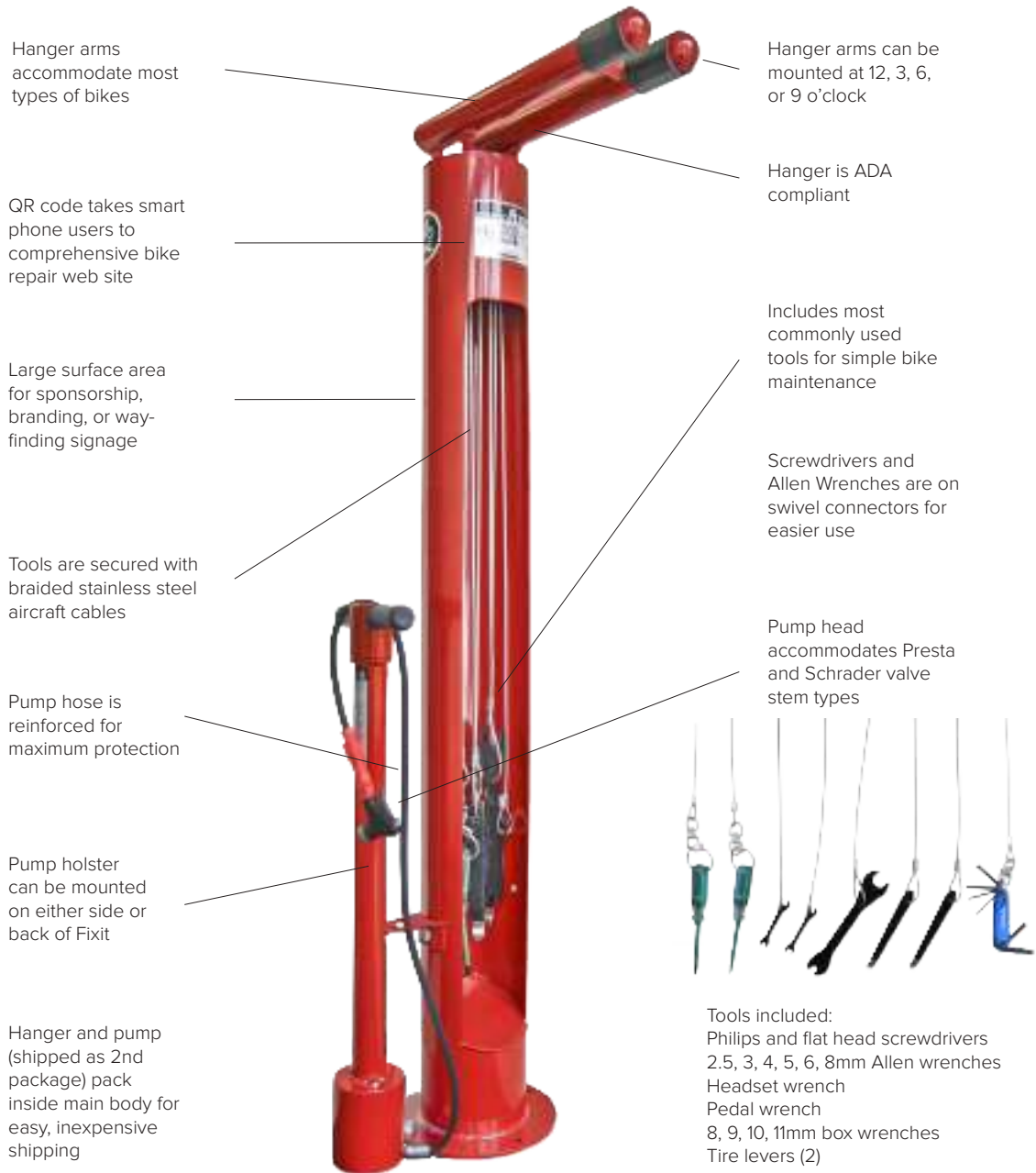
## Today's Service Station

The Fixit includes all the tools necessary to perform basic bike repairs and maintenance, from changing a flat to adjusting brakes and derailleurs. The tools and air pump are securely attached to the stand with stainless steel cables and tamper-proof fasteners. Hanging the bike from the hanger arms allows the pedals and wheels to spin freely while making adjustments.

*Patents D680,914 S1 and US 9,498,880 B2*



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## FINISH OPTIONS

Galvanized

Stainless



Powder Coat

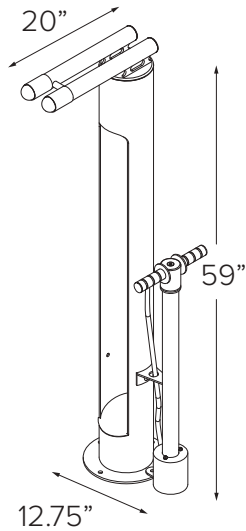
|                         |                    |                         |                      |                          |
|-------------------------|--------------------|-------------------------|----------------------|--------------------------|
| White                   | Black              | Light Gray<br>RAL 7042  | Deep Red<br>RAL 3003 | Yellow<br>RAL 1023       |
| CNH Bright Yellow       | Orange<br>RAL 2004 | Beige<br>RAL 1001       | Iron Gray<br>7011    | Hunter Green<br>RAL 6005 |
| Light Green<br>RAL 6018 | Green<br>RAL 6016  | Sepia Brown<br>RAL 8014 | Bronze               | Silver<br>9007           |
| Dark Purple             | Flat Black         | Wine Red<br>RAL 3005    |                      |                          |

Thermoplastic

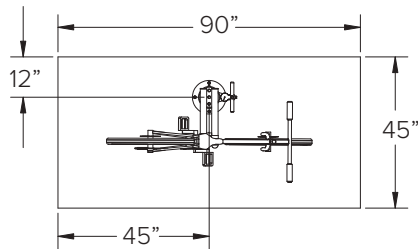
|       |       |     |      |       |
|-------|-------|-----|------|-------|
| Black | Green | Red | Gray | Brown |
|-------|-------|-----|------|-------|







*Fixit with Air Kit 2*



*Minimum Footprint*

## CAPACITY

1 Bike

## MATERIALS

Main body: 6"x .154" tube  
Bike Hanger: 1.5" sch. 40 pipe, 1/4" plate  
Foot: 10" dia. x .25" plate  
Tool tethers: 5/32" stainless steel cable  
Manual air pump

### Hand tools:

Philips and flat head screwdrivers  
2.5, 3, 4, 5, 6, 8mm Allen wrenches  
Headset wrench  
Pedal wrench  
8, 9, 10, 11mm box wrenches  
Tire levers (2)

## FINISHES



### Galvanized

An after fabrication hot dipped galvanized finish is our standard option.



### Powder Coat

Our powder coat finish assures a high level of adhesion and durability by following these steps:

1. Sandblast
2. Epoxy primer electrostatically applied
3. Final thick TGIC polyester powder coat



### Thermoplastic

In addition to an increased thickness (8-10mils), the thermoplastic finish covers a galvanized layer and offers superior impact resistance over powder coating.



### Stainless

Stainless Steel: 304 grade stainless steel material finished in either a high polished shine or a satin finish.

## MOUNT OPTIONS



### Surface

Has 10" diameter x.25" foot with four anchors per foot.



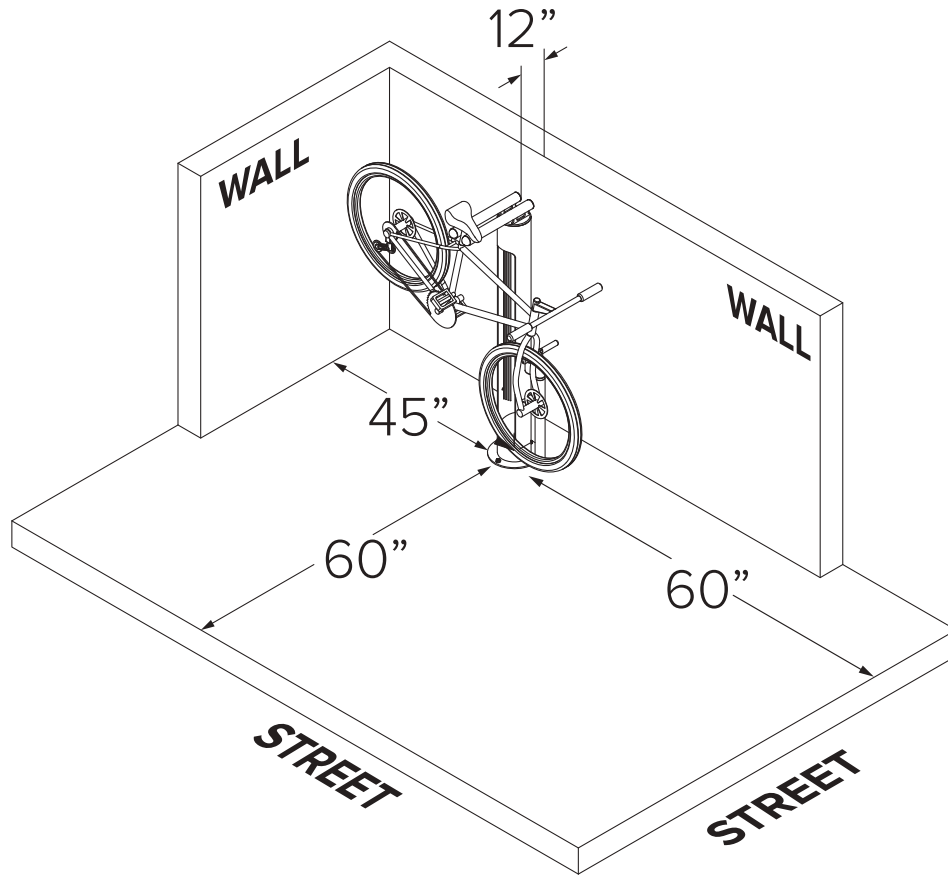
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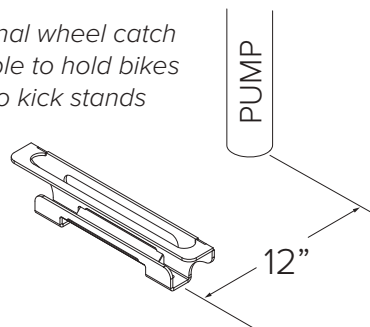
# FIXIT

## Setbacks

---



*An optional wheel catch  
is available to hold bikes  
with no kick stands*



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## FIXIT

# Installation Instructions

### TOOLS NEEDED

Hammer drill  
3/8" masonry bit  
Hammer  
Socket Wrench  
9/16" socket  
Tamper-proof socket (included)\*  
Socket extension, 6" min.

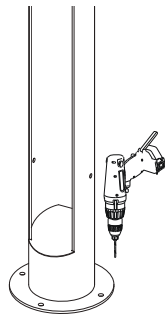
### RECOMMENDED BASE MATERIAL

Solid concrete is the best base material for installation. To ensure the proper anchors are shipped with your rack, ask your Dero Rack representative which anchor is appropriate for your application. Be sure nothing is underneath the base material that could be damaged by drilling.



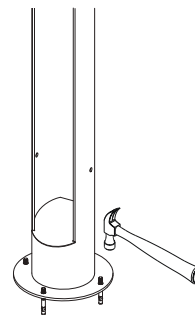
**Be sure to save your tamper-resistant tools for any future maintenance. They are costly to replace.**

# 1



Reference the Fixit setback recommendations and place the upright in the desired location. Use the base as a template and drill (4) 3/8" x 3" holes in the concrete with a hammer drill and masonry bit. Clean up all concrete dust from drilling.

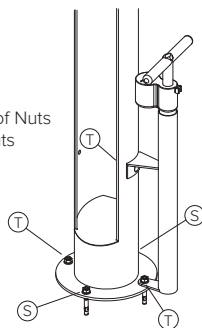
# 2



Hammer in the (4) wedge anchors. Leave at least 3/4" of an inch of exposed threads above the Fixit base.

# 3

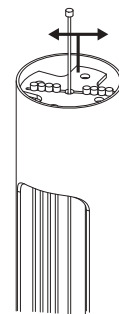
Ⓣ = Tamper-proof Nuts  
Ⓢ = Standard Nuts



Decide which position the pump will be installed in and place the bottom pump flange over the corresponding wedge anchor. Attach the top pump flange to the Fixit upright with a carriage bolt, washer, and tamper-proof nut. Tighten all wedge anchors with washers and nuts.

**Reserve one of the tamper-proof nuts to secure the tools.**

# 4



Insert the tool cables into the cable slot on the Fixit upright.

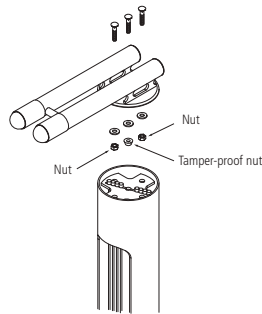


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# Installation Instructions

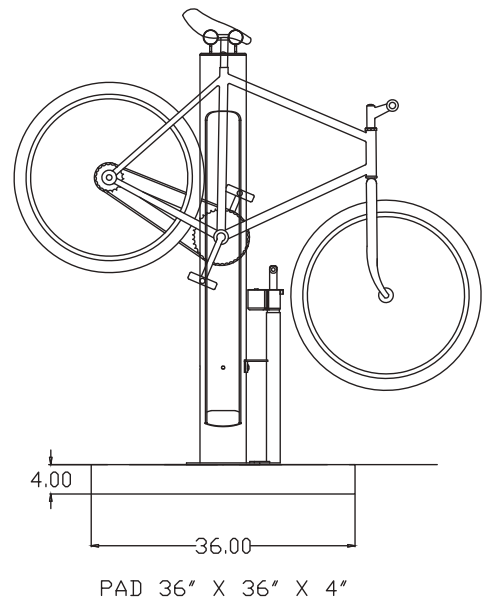
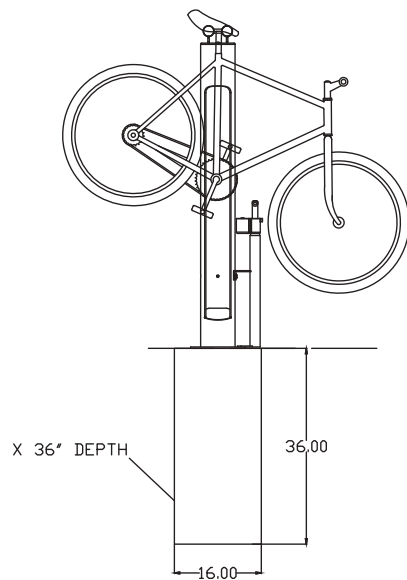
**5**



Place the bike hanger in the desired position on top of the Fixit upright and attach with carriage bolts, washers and nuts. **Apply the tamper-proof nut to center bolt to secure tools.**

After installation is complete, please scan the QR code on the Fixit with a smartphone. This will allow us to add this Fixit station to our map available here:

<http://www.dero.com/fixitmap/fixitmap.html>



*Pad recommendations for pouring along trail*



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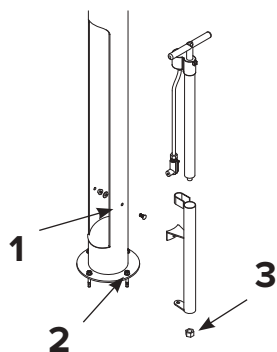
## FIXIT

# Maintenance and Replacement

### NOTE:

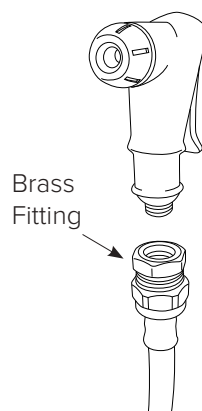
All threads for all parts of the pump are right-hand threads. They tighten clockwise, and loosen counter-clockwise ("righty tighty, lefty loosey"). However, when you are looking top-down at a bolt that threads from underneath, if you move it counter-clockwise from your point of view, you are actually tightening, not loosening, the nut! This has led to some unnecessary breakage of pump parts. Be sure you are looking at the nut with the proper orientation before tightening or loosening.

### REMOVING THE AIR KIT FROM THE FIXIT

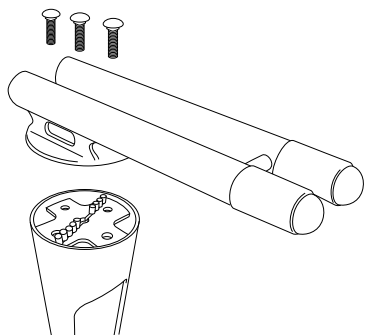


1. Remove nut and bolt on side of Fixit.
2. Remove tamperproof nut on bottom of Fixit, using the Tamperproof Penta Tool supplied for this purpose.
3. Once Airpump is removed, but still in sleeve, remove the 1 3/16" nut on the bottom of the sleeve (turning counter-clockwise). You can now slide the pump out.

### CHANGING THE PUMPHEAD



Remove the shrinkwrap. Unscrew the pumphead from the brass fitting (turning counter-clockwise). You will need to keep the brass fitting for the new pumphead. Replace the pumphead. If you want to put on shrinkwrap, then put the shrinkwrap sleeve over the hose before replacing pumphead. Once pumphead is on, pull shrinkwrap sleeve over the brass fitting and use a heatgun to shrink it.



### REPLACING TOOLS

There are three bolts at the top of the Fixit. Underneath are two 3/8" nuts, and one penta tamper-proof nut (center bolt). These are all best removed with a socket wrench, using the extension tool to enable you to reach the nuts. Once the nuts are removed, take off the cap to replace tools.



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# DERO PARKLET



## Modular Urban Oasis

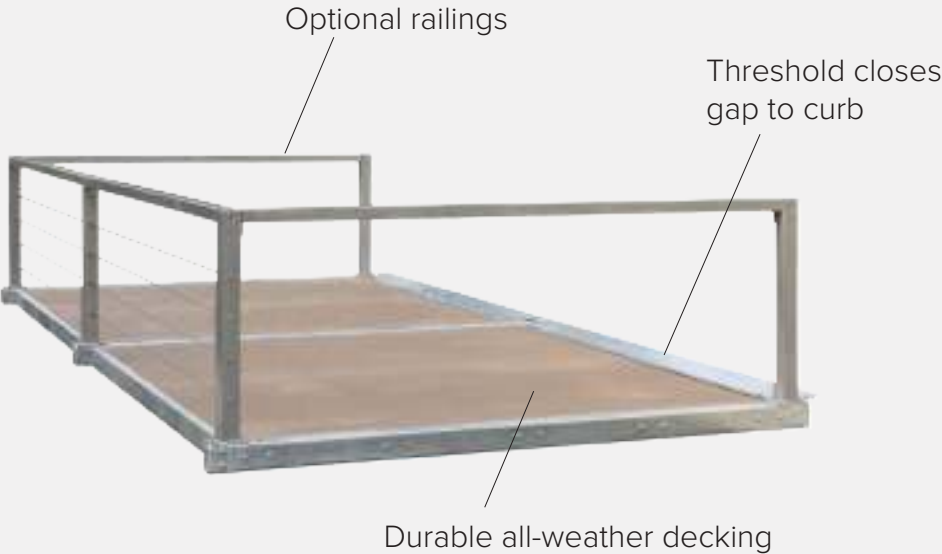


The Dero Parklet is an innovative way to build public gathering spaces right in the heart of the urban streetscape. Local businesses with limited sidewalk space now have the unique ability to extend their atmosphere and aesthetic to the outdoors. The Dero Parklet's modular design allows each space to be built to suit any vision. With a galvanized steel frame and recycled paper-based fiber composite decking, this little urban oasis has the durability to last through all seasons.



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# DERO PARKLET



## FINISH OPTIONS

Galvanized (Main Frame)

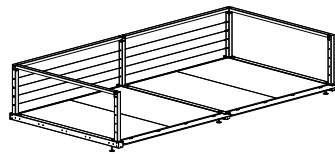
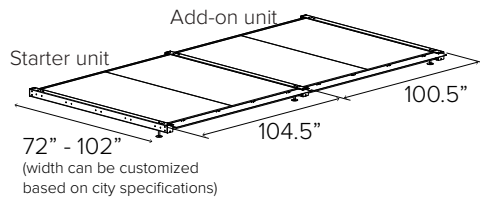


Powder Coat (Railing)

|                         |                    |                         |                      |                          |
|-------------------------|--------------------|-------------------------|----------------------|--------------------------|
| White                   | Black              | Light Gray<br>RAL 7042  | Deep Red<br>RAL 3003 | Yellow<br>RAL 1023       |
| CNH Bright Yellow       | Orange<br>RAL 2004 | Blue<br>RAL 5005        | Sky Blue<br>RAL 5015 | Hunter Green<br>RAL 6005 |
| Light Green<br>RAL 6018 | Green<br>RAL 6016  | Sepia Brown<br>RAL 8014 | Bronze               | Silver<br>9007           |
| Dark Purple             | Flat Black         | Wine Red<br>RAL 3005    | Beige<br>RAL 1001    | Iron Gray<br>7011        |

## PARKLET

# Submittal Sheet



Starter unit, add-on unit,  
railings, and cables

### MATERIALS

Main Frame: 4"x 11g square tube  
Joist: 2"x 3/16" square tube  
Deck Panel: 4' x 8' x 1/2" recycled paper-based fiber composite  
Railing Upright: 3" x 11g square tube  
Railing: 11g plate  
Cable: 3/16" stainless, 316 grade

### FINISHES



#### Galvanized (Main Frame)

An after fabrication hot dipped galvanized finish is our standard option.



#### Powder Coat (Railings)

Our powder coat finish assures a high level of adhesion and durability by following these steps:

1. Sandblast
2. Epoxy primer electrostatically applied
3. Final thick TGIC polyester powder coat

### MOUNT OPTIONS

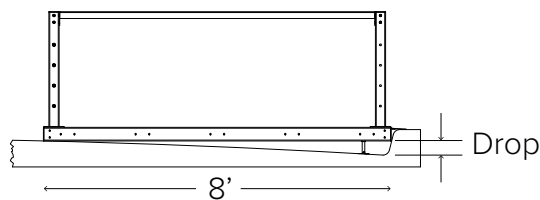


#### Surface

The Dero Parklet rests on the installation surface. No drilling is required. It is the responsibility of the installer to ensure that all base materials onto which the Dero Parklet will be installed can support the unit and will not be damaged by any required installation procedures.

### LOAD DATA

The Parklet can support 60 psf, or 3,800 lbs/section.



#### Street Drop

To ensure proper leveling feet are shipped with the Dero Parklet, please determine the amount of drop that occurs over the 8' where the parklet will be located.



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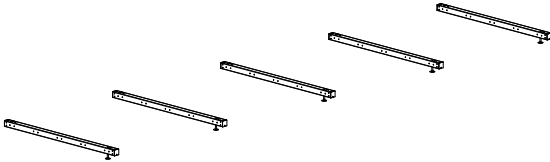
## PARKLET

# Installation Instructions - Deck (1 of 2)

### TOOLS NEEDED

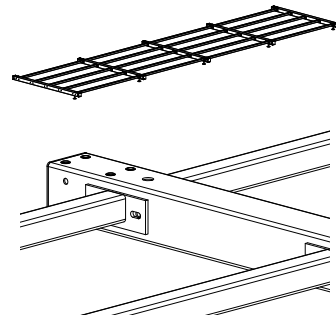
Tape measure  
Level  
9/16" Socket wrench and box wrench  
7/16" Socket wrench  
7/16" Allen wrench

# 1



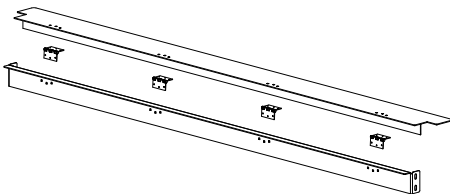
Place the 4" square pieces about 100.5" on-center. Use as many pieces as necessary for the length of deck being built. Placement should be close to the final desired location. The whole deck may be nudged using wood 2x4's as levers. For example, it may be easier to leave the deck 6" from a curb to aid assembly. For installation on a sloped surface, use (1) leveling foot on each piece.

# 2



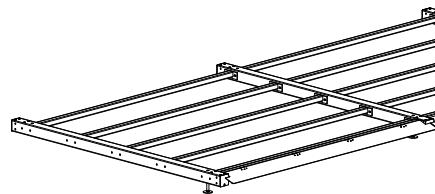
Install (5) Joists per section with 3/8" x 5.5" bolts, washers, and nuts. The flush side of the Joist should be upwards.

# 3



Assemble the Gap Cover, Deck End, and hinges with 1/4" x 3/4" carriage bolts, lock washers, and nuts.

# 4



Place the Gap Cover assemblies on the side of the deck that will be adjacent to the curb and attach with 3.8" x 5" bolts, washers, and nuts. Keep hardware finger-tight.



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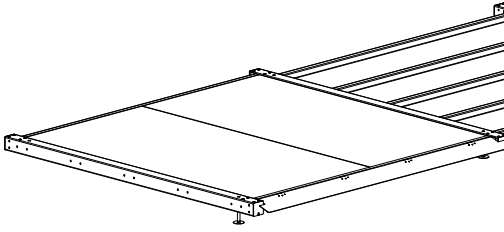
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## PARKLET

# Installation Instructions – Deck (2 of 2)

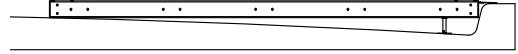
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5



Place (2) Deck Panels per section. Deck Panels should go underneath the lip of the Deck Ends. When all Deck Panels are placed, the Deck Ends should be pressed down and their hardware fully tightened.

6



Nudge deck assembly as close to the curb as possible using wood 2x4's as levers. Lower the Gap Cover to sit on top of the curb.



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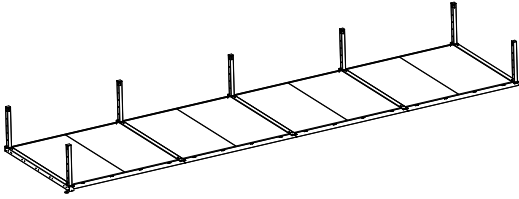


## PARKLET

# Installation Instructions - Railing

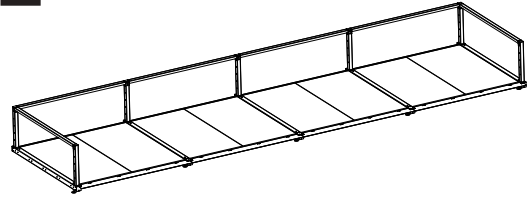
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1



Place Railing Uprights on (4) outermost deck corners and along deck side adjacent to street. Attach with 3/8" x 1" bolts and lock washers. Keep hardware finger-tight.

2



Attach Railing between Uprights with 3/8" x 1" bolts and lock washers. Shorter Railings are placed on the ends and longer Railings are placed adjacent to the street.

Fully tighten all hardware.



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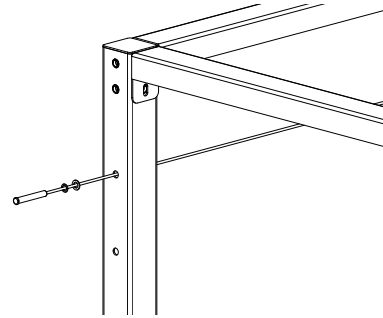
## PARKLET

# Installation Instructions - Cables

1

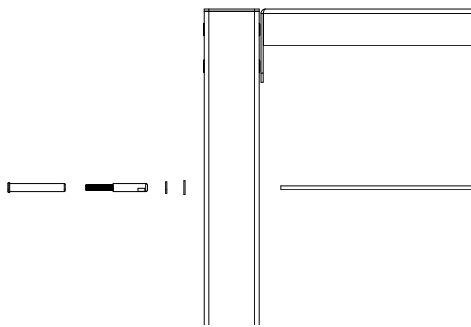
Refer to cable instructions for details on attaching the cable to the end fittings.

2



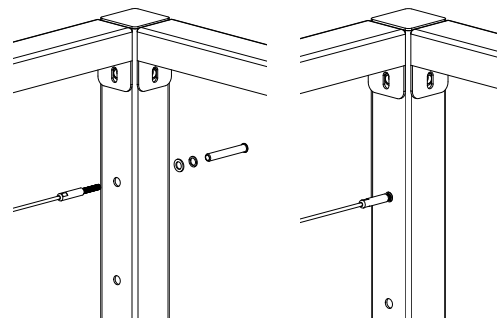
Run the first cable with end fitting, plastic washer, and metal washer through one set of holes in the Railing Uprights.

3

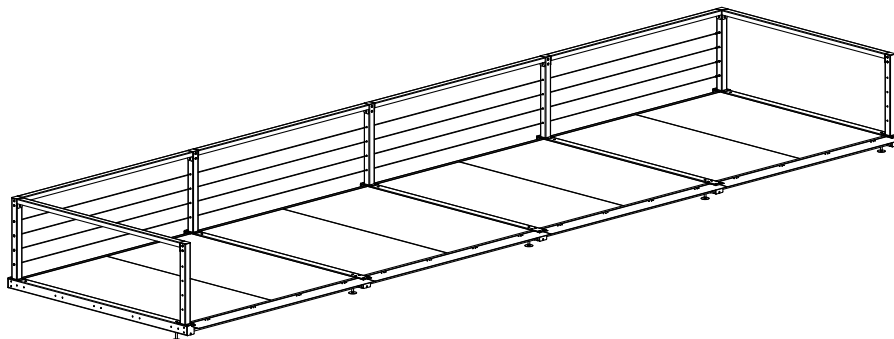


Pull the cable taut and confirm the first end fitting is completely seated in the Railing Upright. Mark the cable 1.5" from the inside surface of the last Railing Upright and trim with an angle grinder fitted with a cut-off wheel. Use the side of the cutoff wheel to de-burr the cable end.

4



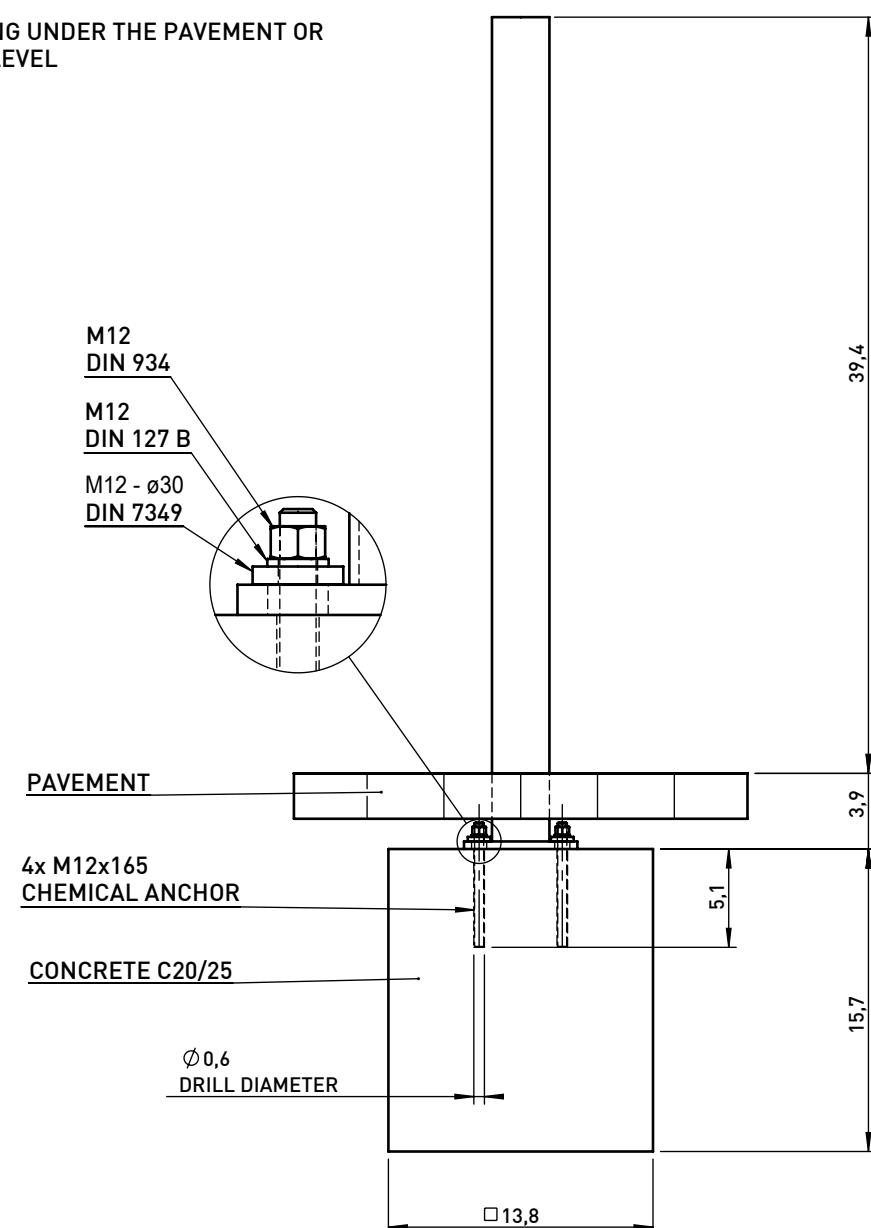
Attach male end fitting to cable and attach to female fitting with plastic washer and metal washer. Tighten with Allan wrench and repeat with other cables. After tightening last cable, return to previous cable and check tightness.



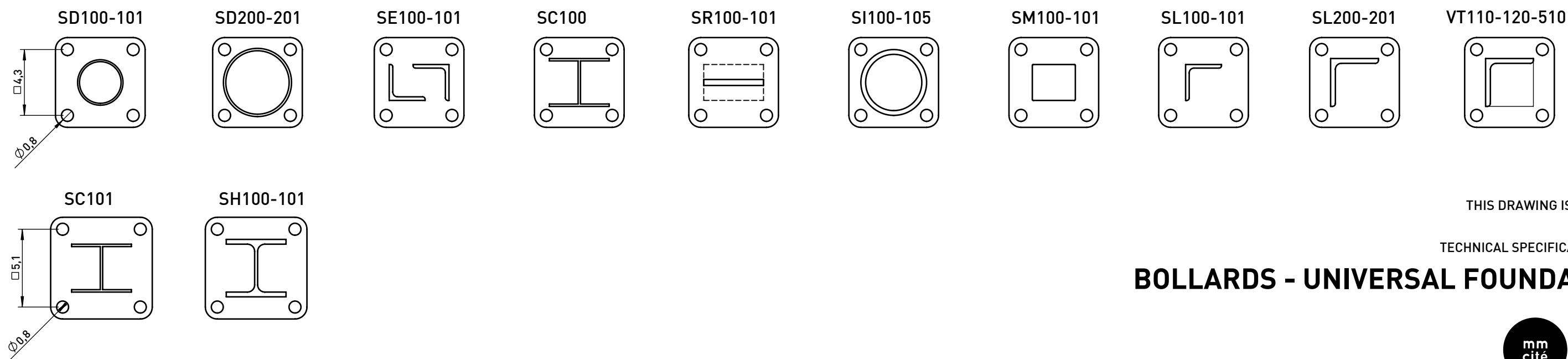
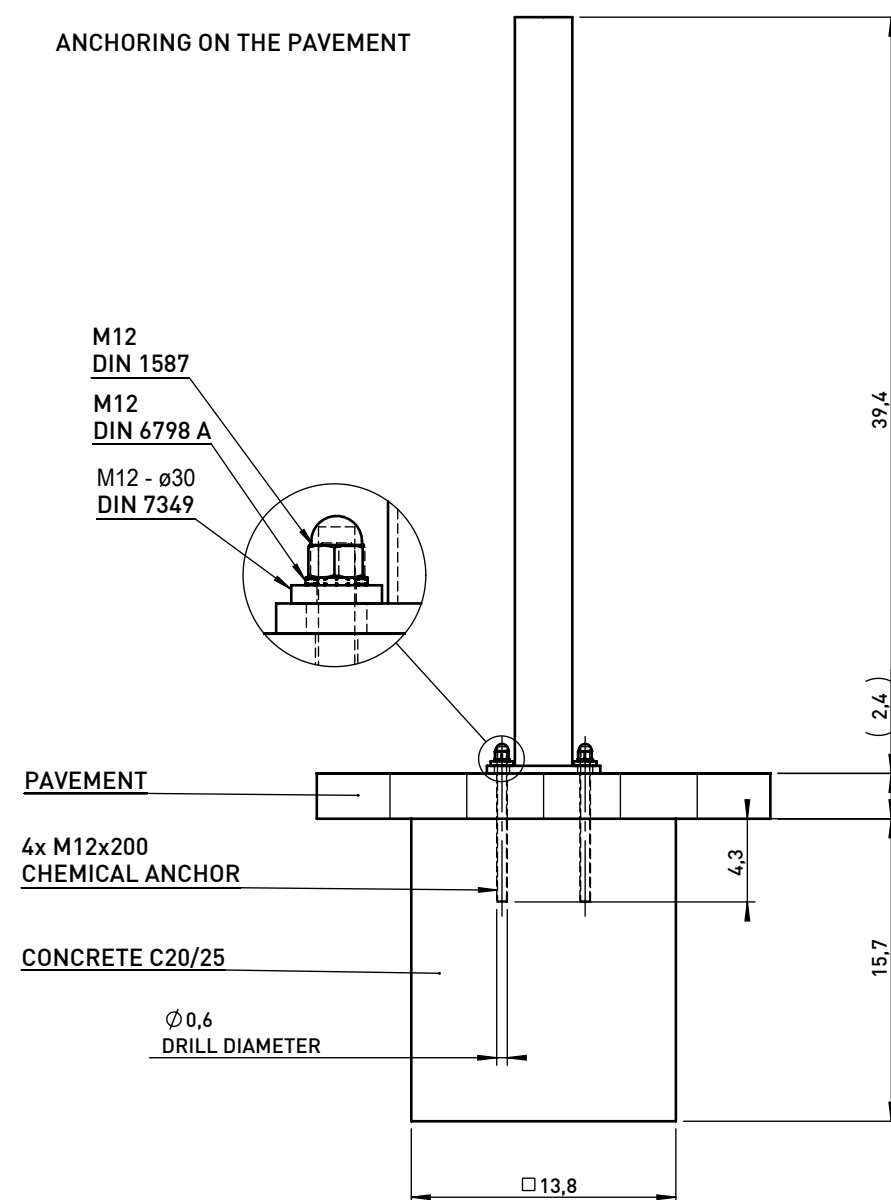
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# ANCHORING UNDER THE PAVEMENT OR GROUND LEVEL



# ANCHORING ON THE PAVEMENT



THIS DRAWING IS IN INCHES

TECHNICAL SPECIFICATIONS 3/5

## BOLLARDS - UNIVERSAL FOUNDATION

## Cast column

|                           |  |
|---------------------------|--|
| <b>Construction type:</b> | Aluminium allow casting with a conical shape and round ending on the column head.  |
| <b>Coating:</b>           | Column cast is supplied with powdered stoving varnish, it can be made without any other surface treatment by request.  |
| <b>Body:</b>              | Aluminium alloy cast; with 12mm (0.5") thick welded heel, total column weight 952mm (37").   |
| <b>Colour scheme:</b>     | Shades of polyester powder coatings in the fine structure mat, standardly provided by mmcité.<br><br>Other shades according to the RAL sampler are available on request.   |
| <b>Anchoring:</b>         | Anchoring under the paving or in compacted terrain into concrete foundation using M12 (1/2") threaded rods.<br><br>All supplies of street furniture must be fixed according to the manufacturer's technical instructions. If these indications are not met, you risk a damage of product and human consequences. The manufacturer declines any responsibility for possible damages caused, directly or indirectly, to people, animals or things caused by non-compliance with the instructions manuals and, in particular, with installing, use and service operating instruction. |
| <b>Weight:</b>            | 8kg (18lb)   |
| <b>Option:</b>            | Different colour than standard colour.<br><br>Without powder colour.   |
| <b>Warning:</b>           | The barrier post is not certified as a guardrail or restraint system for roads. For a decision about the location of the posts are fully responsible designer, who must take into account all the circumstances of place of realization. For the location of the posts in contradiction with current legislation manufacturer accepts no responsibility.   |

DATE: 02.07.2013 V:02  
TECHNICAL SPECIFICATIONS

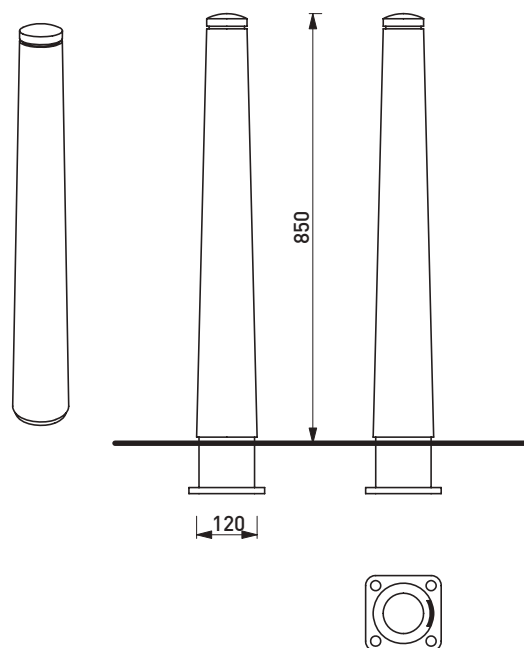
**ISAC SI105**

Rozměry výrobků mají informativní charakter. Výrobce si vyhrazuje právo na změnu technické specifikace bez předchozího upozornění. Rozměry spodní stavby a způsob osazení výrobku jsou závazné. Rozteče kotev rozměřovat dle rozměrů dodaného výrobku.  
All product sizes have an informative character. The producer reserves the right to amend the technical specification at any time without previous warning. The size of foundation baseplate and the method of mounting of the product are imperative. Anchor spacing measure out by measurements of supplied product.  
Die Abmessungen der Produkte sind informativ. Der Hersteller behält sich das Recht an Änderungen der technischen Spezifikationen vor, ohne vorher darauf hinzuweisen. Abmessungen der Fundamentierung – Unterbau und Art des Produkteinbaus sind verbindlich. Ankerabstand gemäß der gelieferten Produktabmessungen dimensionieren.  
Dimensions des produits sont à titre informatif seulement. Le fabricant se réserve le droit de modifier les spécifications techniques sans préavis. Dimensions des fondations et manière de l'implantation du produit sont obligatoires. Ancrer écartement dimensions à partir des dimensions du produit livré.  
Las dimensiones de los productos tienen carácter informativo. El fabricante se reserva el derecho de cambio de la especificación técnica sin aviso previo. Tanto las dimensiones de las bases de cimentación como el sistema de fijación son inalterables. Hay que medir el espaciamiento de anclajes según las dimensiones del producto suministrado.





ILLUSTRATIVE PHOTO



TECHNICAL SPECIFICATIONS 2/5

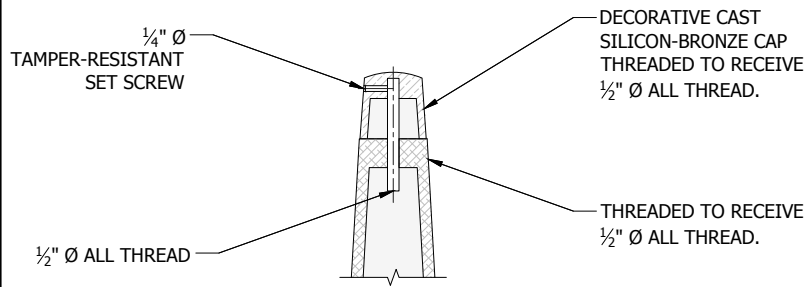
**SI105 - ISAC**



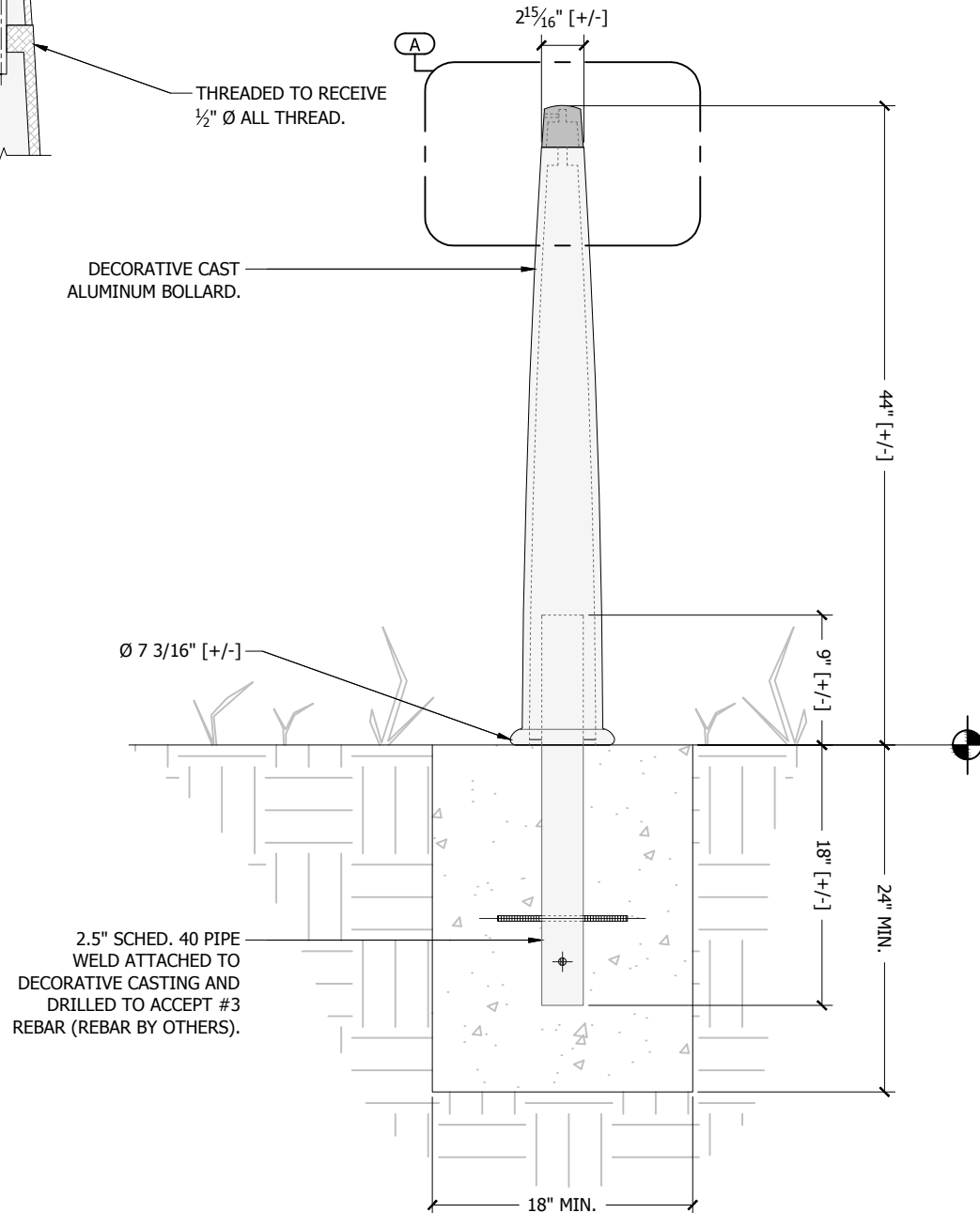
**mmcite.com**

Rozměry výrobků mají informativní charakter. Výrobce si vyhrazuje právo na změnu technické specifikace bez předchozího upozornění. Rozměry spodní stavby a způsob osazení výrobku jsou závazné. Rozteče kotev rozměřovat dle rozměrů dodaného výrobku.  
 All product sizes have an informative character. The Producer reserves the right to amend the technical specification at any time without previous warning. The size of foundation baseplate and the method of mounting of the product are imperative. Anchor spacing measure out by measurements of supplied product.  
 Die Abmessungen der Produkte sind informativ. Der Hersteller behält sich das Recht an Änderungen der technischen Spezifikationen vor, ohne vorher darauf hinzuweisen. Abmessungen der Fundamentierung - Unterbau und Art des Produkteinbaus sind verbindlich. Ankerabstand gemäß der gelieferten Produktabmessungen dimensionieren.





### Detail A



### SPECIFICATIONS

- Cast components will be of 100% recycled aluminum; ASTM B261.
- Castings will be squared and flat, free of burrs, slag, air pockets, blow holes, flashing, and grinding or welding on exposed surfaces. Excessive warping or shrinkage is not acceptable.
- Fabricated components will be of structural aluminum, 6061 - T6.
- All visible welds to be ground smooth on outside edges.
- Fabrication will be true to square, or diameter and sized within 1/8".
- Finish to be powder coat, standard UA color and applied per UA specifications. If alternate color or finish is required, please provide all finish information for UA approval.
- Dimensions shown are nominal.
- For cases of "or equal" consideration, our finished, full size product should be compared with the alternative product for general quality, surface finish, precise pattern work, metal characteristics, and overall design aesthetics.

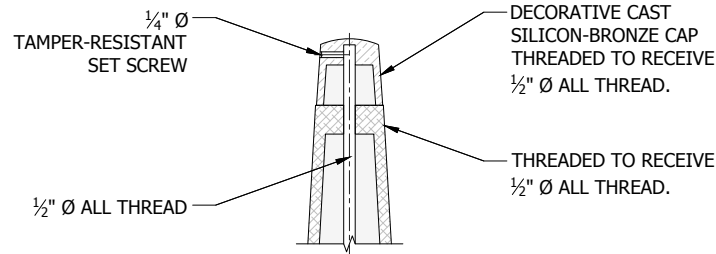
### Bollard

DG4  
Cast In

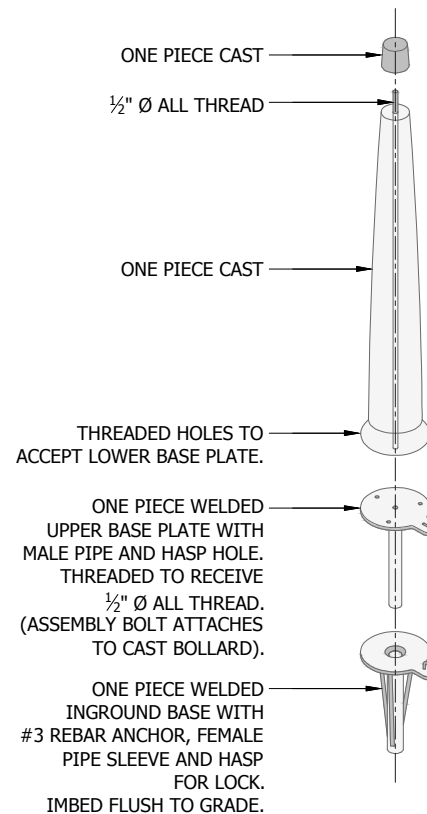
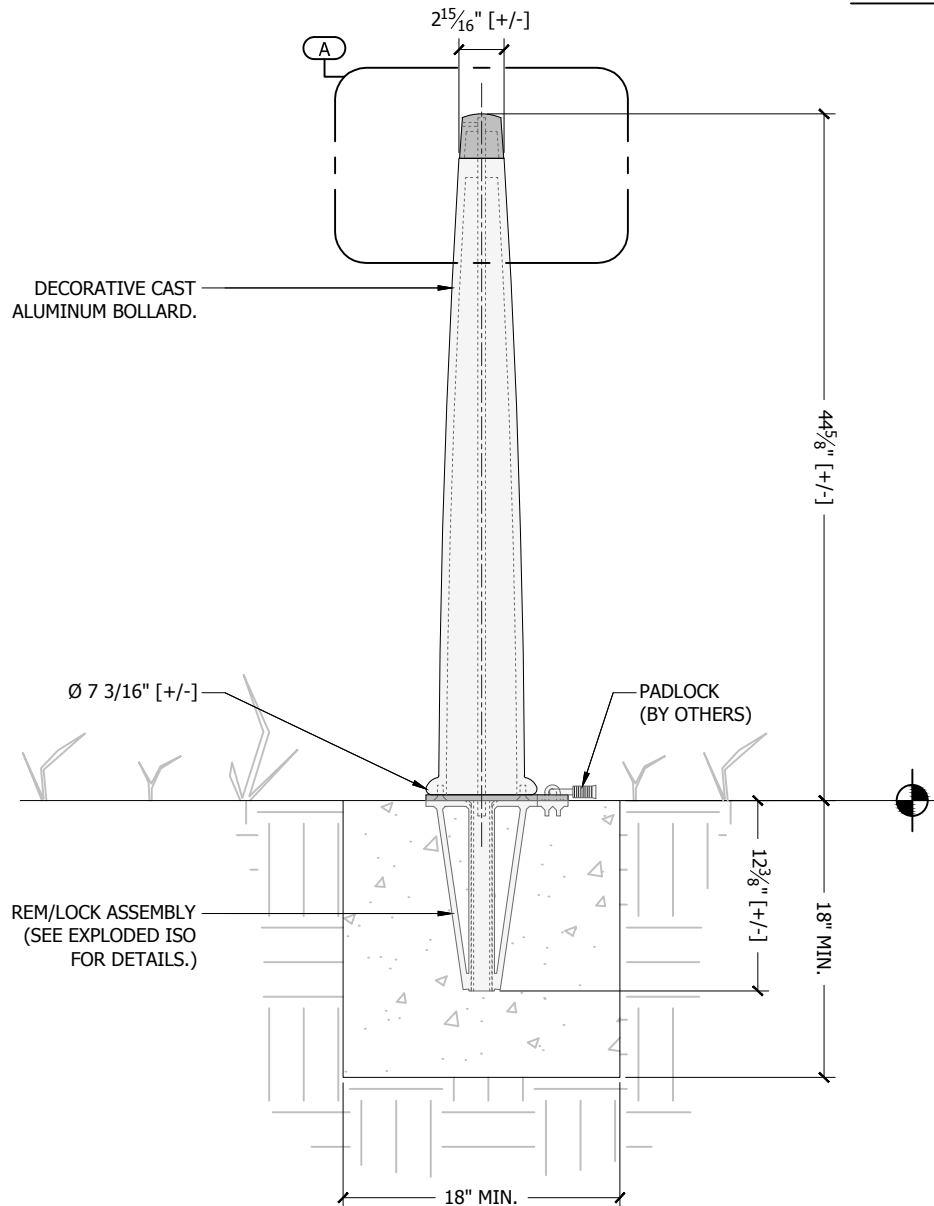
Page: 1 of 1 Date: 2/7/13



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TACOMA, WA 98421 www.urbanaccessories.com  
(877) 487-0488



**Detail A**



## SPECIFICATIONS

- Cast components will be of 100% recycled aluminum; ASTM B261.
- Castings will be squared and flat, free of burrs, slag, air pockets, blow holes, flashing, and grinding or welding on exposed surfaces. Excessive warping or shrinkage is not acceptable.
- Fabricated components will be mild carbon steel, ASTM A36.
- All visible welds to be ground smooth on outside edges.
- Fabrication will be true to square, or diameter and sized within 1/8".
- Finish to be powder coat, standard UA color and applied per UA specifications. If alternate color or finish is required, please provide all finish information for UA approval.
- Dimensions shown are nominal.
- For cases of "or equal" consideration, our finished, full size product should be compared with the alternative product for general quality, surface finish, precise pattern work, metal characteristics, and overall design aesthetics.

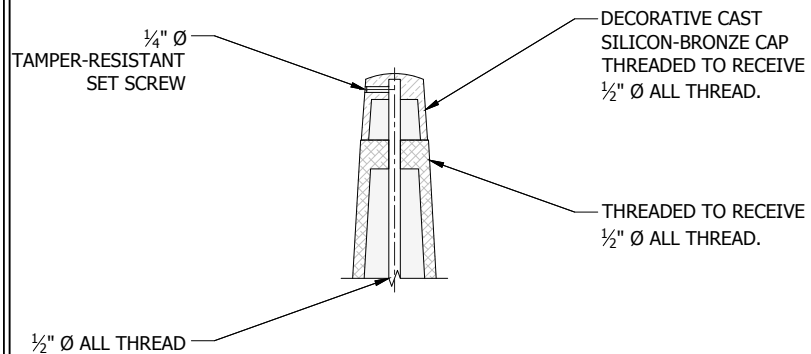
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DG4  
REM / LOCK

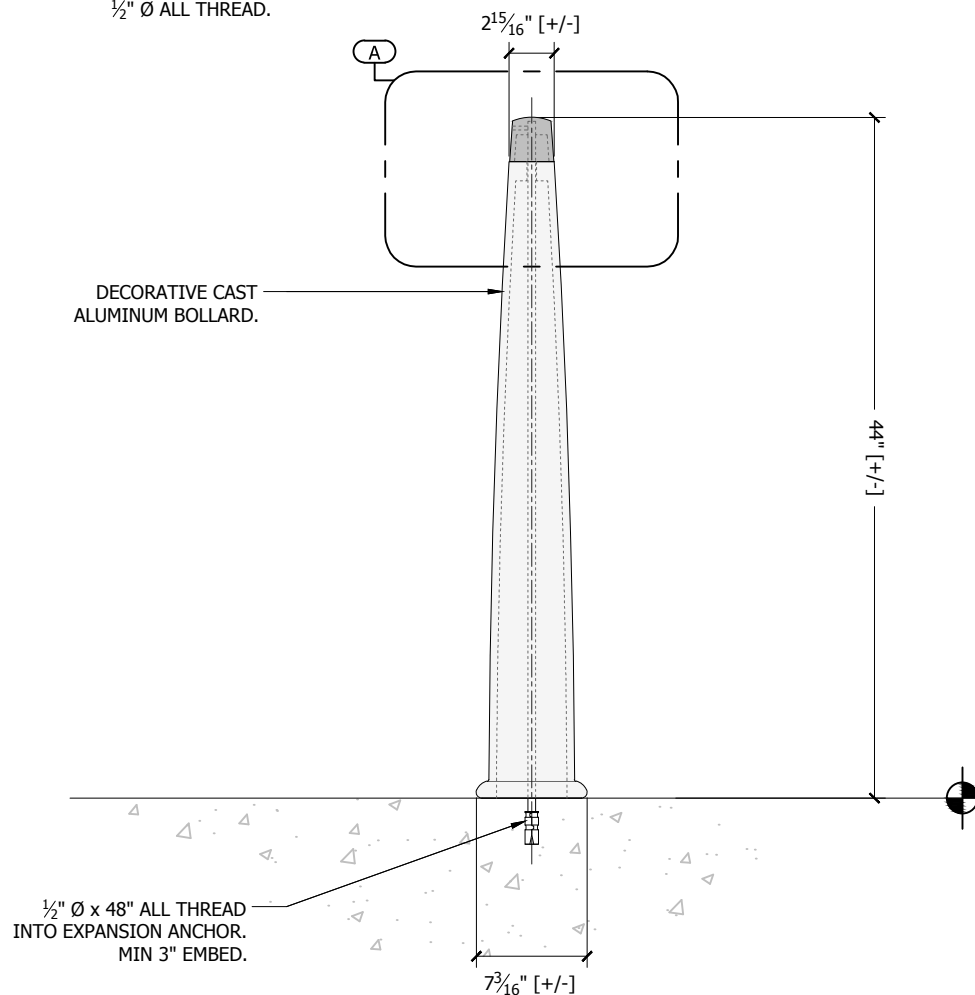
Page: 1 of 1 Date: 12/13/12



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**Detail A**



## SPECIFICATIONS

- Cast components will be of 100% recycled aluminum; ASTM B261.
- Castings will be squared and flat, free of burrs, slag, air pockets, blow holes, flashing, and grinding or welding on exposed surfaces. Excessive warping or shrinkage is not acceptable.
- Fabricated components will be mild carbon steel, ASTM A36.
- All visible welds to be ground smooth on outside edges.
- Fabrication will be true to square, or diameter and sized within 1/8".
- Finish to be powder coat, standard UA color and applied per UA specifications. If alternate color or finish is required, please provide all finish information for UA approval.
- Dimensions shown are nominal.
- For cases of "or equal" consideration, our finished, full size product should be compared with the alternative product for general quality, surface finish, precise pattern work, metal characteristics, and overall design aesthetics.

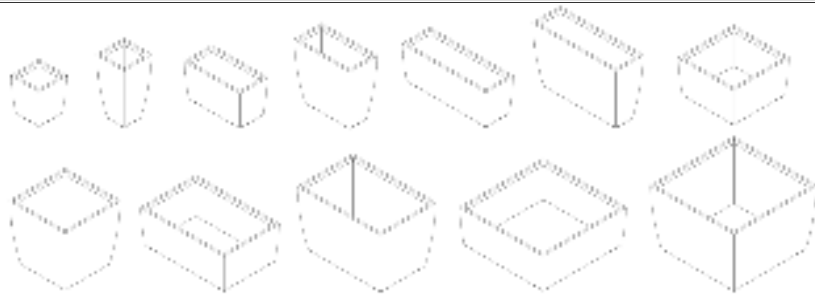
## Bollard

DG4  
Surface Mount

Page: 1 of 1 Date: 12/13/12



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## Planter Sizes

### Included components:

- Planters intended for exterior use should be specified with drain holes
- Planters intended for interior use should be specified without drain holes
- Drain holes are pre-drilled at the factory. They can be added on site, before installation, if needed. Refer to Product drawings for locations.
- Anchoring hardware included for surface mount units. Setting tool for drop-in anchor is included.



2x – Surface Mount anchor, with 1/2-13 thread



2x – Drop-in 1/2-13 screw anchor, Ø5/8" O.D. x 2" length, stainless steel



2x – 1/4-20 x 1/2" Set screw

### Surface Mount Hardware

| Planter Size          | Capacity               |
|-----------------------|------------------------|
| 15"w x 15"d x 18"h    | 13 Gallons (1.7 ft³)   |
| ** 15"w x 15"d x 30"h | 19 Gallons (2.5 ft³)   |
| 30"w x 30"d x 18"h    | 55 Gallons (7.3 ft³)   |
| 30"w x 30"d x 30"h    | 89 Gallons (11.9 ft³)  |
| 45"w x 45"d x 18"h    | 127 Gallons (17 ft³)   |
| 45"w x 45"d x 30"h    | 211 Gallons (28.2 ft³) |
| 30"w x 15"d x 18"h    | 26 Gallons (3.5 ft³)   |
| ** 30"w x 15"d x 30"h | 40 Gallons (5.4 ft³)   |
| 45"w x 15"d x 18"h    | 40 Gallons (5.4 ft³)   |
| ** 45"w x 15"d x 30"h | 62 Gallons (8.3 ft³)   |
| 45"w x 30"d x 18"h    | 83 Gallons (11.1 ft³)  |
| 45"w x 30"d x 30"h    | 137 Gallons (18.4 ft³) |

\*\* These sizes must be surface mounted.

### Tools required for surface mount installation:

- Hammer drill with 5/8" diameter masonry bits
- Hammer
- Slotted screwdriver

**ASSEMBLE WITH CARE!** Pangard II® Polyester Powdercoat is a strong, long-lasting finish. To protect this finish during assembly, place unwrapped powdercoated parts on packaging foam or other non-marring surface. Do not place or slide powdercoated parts on concrete or other hard or textured surface – this will damage the finish causing rust to occur. Use touch-up paint on any gouges in the finish caused by assembly tools.

## A. PROCEDURE FOR FREESTANDING INSTALLATION:

- Set unit in place on level surface.
- Fill units with specified materials.



## B. ADDING OPTIONAL DRAIN HOLES:

- Drill ½" diameter holes in locations noted on Product Drawings.
- Do not drill drain holes in any of the four squares surrounding the raised bosses.



Fig. C.1

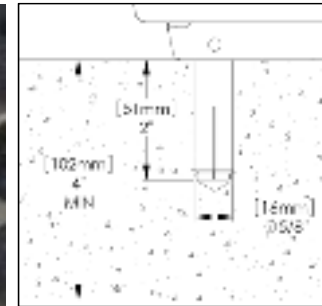


Fig. C.3

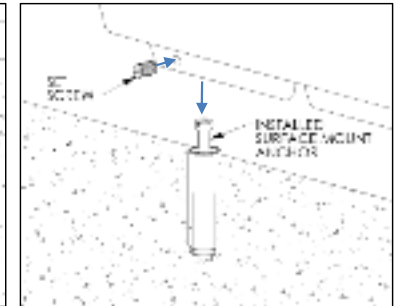


Fig. C.4

## C. SURFACE MOUNT INSTALLATION PROCEDURE:

- Turn planter upside down on non-marring surface. Thread surface mount anchors into each surface mount glide as shown in Fig. C.1.
- Set planter in place. Trace surface mount bolt heads to mark hole locations. Remove surface mount anchors from planter.
- Move planter and drill holes as shown in Fig. C.3. Clear holes of debris.
- Install drop-in anchor as shown in Fig. C.4. Ensure top of anchor is flush or slightly below concrete surface. Expand with setting tool.
- Thread surface mount anchors into drop-in anchor sleeves as shown in Fig. C.4
- Set planters in place over surface mount anchors.
- Thread set screws into sides of surface mount glides as shown in Fig. C.4

# SORELLA

## Product Data Sheet



Classic in form. Sleek in steel. Sorella is the lovely Italian word for "sister" and an apt name for this attractive family group. Sorella planters are related in their construction and softly curved rectilinear profile, complementary in their individual shapes and sizes.

### Sorella

- Sorella planters may be specified in powdercoated metal.
- Planters available in rectangle or square shapes, in 18" and 30" heights.
- Fabricated, welded and ground steel panels attach to a recycled plastic base, with glides and optional drain holes.
- Planter bases and glides are compression-molded recycled plastic resulting from an innovative, patented melting process that utilizes 100% post-consumer and post-industrial waste.
- This unique process blends several material types, channeling more discarded plastics away from the landfill and into new life.
- Bases are 100% recyclable.













### Finishes

- All metal is finished with Landscape Forms' proprietary Pangard II® polyester powdercoat, a hard yet flexible finish that resists rusting, chipping, peeling and fading.
- A wide range of standard, optional and custom colors are available.

### To Specify

- Select Sorella planter, product description and size.
- Select powdercoat metal color.
- Specify with or without drain holes.

Designed by Robert Chipman, ASLA

|   | STYLE           | DEPTH | WIDTH | HEIGHT | PRODUCT WEIGHT |
|---|-----------------|-------|-------|--------|----------------|
|    | freestanding    | 15"   | 15"   | 18"    | 29 lb          |
|    | freestanding    | 30"   | 30"   | 18"    | 74 lb          |
|   | freestanding    | 45"   | 45"   | 18"    | 129 lb         |
|  | freestanding    | 30"   | 15"   | 18"    | 48 lb          |
|  | freestanding    | 45"   | 15"   | 18"    | 67 lb          |
|  | freestanding    | 45"   | 30"   | 18"    | 96 lb          |
|  | surface mounted | 15"   | 15"   | 30"    | 39 lb          |
|  | freestanding    | 30"   | 30"   | 30"    | 96 lb          |
|  | freestanding    | 45"   | 45"   | 30"    | 165 lb         |
|  | surface mounted | 30"   | 15"   | 30"    | 65 lb          |
|  | surface mounted | 45"   | 15"   | 30"    | 90 lb          |
|  | freestanding    | 45"   | 30"   | 30"    | 125 lb         |





36"w X 36"d X 24"h



48"w X 48"d X 30"h



32"w X 32"d X 48"h

---

**Included components**

- Planter

---

**Capacity:**

| Planter Size       | Capacity                          | Weight of Planter (empty) |
|--------------------|-----------------------------------|---------------------------|
| 36"w X 36"d X 24"h | 52 Gallons (7 ft <sup>3</sup> )   | 757 lbs.                  |
| 48"w X 48"d X 30"h | 127 Gallons (17 ft <sup>3</sup> ) | 1582 lbs.                 |
| 32"w X 32"d X 48"h | 75 Gallons (10 ft <sup>3</sup> )  | 1362 lbs.                 |

**CAUTION!** These planters are heavy. The planters should be moved with care to protect the base and rims from chipping. Do not place on their side or top. Keep the planter upright at all times except if placed on a soft surface, such as a carpeted furniture dolly. Because of their weight, distance moving is best accomplished by placing the planter on a reinforced pallet and moving it with a forklift.

**PROCEDURE FOR INSTALLATION:**

1. Set unit in place on level surface.
2. Fill units with specified materials.

**DRAIN HOLES:**

Each planter has one 2" diameter drain hole in the center of the base of the planter. The 36"w x 36"d x 24"h planter is 3" thick at the base, while the 48"w x 48"d x 30"h planter and the 32"w x 32"d x 48"h planter are 3-1/2" thick at the base.

Drain holes may not be added in the field.

# LARKSPUR™

## Product Data Sheet



Subtle in shape and commanding in size, these beautifully proportioned cast concrete planters by designer Larry Kornegay are, like their namesake flower, products of nature and no two are exactly alike. Cast concrete lends compelling individuality in surface qualities that give each Larkspur planter its own variations and visual interest. The strength and durability of the material ensures performance in all climates while weather and age impart a patina that attests to its timelessness.

### Planter

- Larkspur planters are available in three sizes.
- Constructed of cast concrete, pricing includes the planter in a variety of standard colors.
- The 24"h planter is a 36" square planter with rounded corners and holds approximately 7 cubic feet (52 gallons) of planting material.
- The 30"h planter is a 48" square planter with rounded corners and holds approximately 17 cubic feet (127 gallons) of planting material.
- The 48"h planter is a 32" square planter with rounded corners and holds approximately 10 cubic feet (75 gallons) of planting material.




### Material

- Concrete is the traditional mixture of sand, rocks (aggregate), water and the binding materials cement and fly ash.
- When appropriate, additives are included that enhance the concrete's durability in cold weather conditions.
- The strength of the concrete is tested regularly, and measures between 5000-6000psi.

### To Specify

- Specify Larkspur planter size and standard color.
- Planters are freestanding and ship with a standard 2" drain hole.
- See materials sheet for color options.

**Designed by Larry Kornegay**

|   | STYLE | DEPTH | WIDTH | HEIGHT | PRODUCT WEIGHT |
|---|-------|-------|-------|--------|----------------|
|    | 48"   | 32"   | 32"   | 48"    | 1,432 lb       |
|   | 24"   | 36"   | 36"   | 24"    | 800 lb         |
|  | 30"   | 48"   | 48"   | 30"    | 1,707 lb       |

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# Downtown Collection

*Modern is the new classic!*

By adding a distinctive curve and soft corners, Tournesol Siteworks has created a new classic container, the Downtown Collection. Using tall, elegant proportions typical of the new modern, it adds flair to any project. All round, square and rectangular shapes carry the distinctive proportions, while available shallower round sizes are useful for flower and color displays.



- Lightweight FRP fiberglass and GFRG designed to be durable despite low weight - even for heavy-traffic locations
- Coordinates with our self-watering container irrigation products
- Metallic FRP finishes will naturally weather over time, like metal containers
- Round, square and rectangular sizes from 18" to 60", with customization available
- Matching ash, trash available



Downtown Round

Materials & Finishes - Metal Infused finishes (Aluminum, Bronze, Copper and Iron) combine the light weight and durability of FRP with the natural patina of real metal. The metal will oxidize naturally, depending on the location and condition of the installation. For those that love the look of the metal but want to keep the color the way it starts, we offer a Metal Matched Paint that simulates the color. Our economical standard paint finishes use a high-quality industrial grade acrylic enamel in a variety of architectural colors.



Downtown Shallow Round  
Shark (with texture)



Downtown Square  
Chapparal



**Tournesol**  
SITEWORKS

[tournesolsiteworks.com](http://tournesolsiteworks.com)  
800.542.2282

## Rounds

| Part No. | Material | Exterior Size<br>(top x bottom x ht) | Interior Size<br>(top x bottom x ht) | Weight<br>(lbs.) | Soil Volume<br>(cubic ft.) | Matching Irrigation  |
|----------|----------|--------------------------------------|--------------------------------------|------------------|----------------------------|----------------------|
| DS-1800  | FRP      | 18" x 13.5" x 18"                    | 14" x 13" x 17.5"                    | 11               | 2                          | CWM-1114-MS          |
| DS-2400  | FRP      | 24" x 15.5" x 27"                    | 20" x 15" x 26.5"                    | 21               | 4.7                        | CWC-1600/CWM-1114-2k |
| DS-2418  | FRP      | 24" x 13" x 18"                      | 20" x 12.5" x 17.5"                  | 15               | 2.8                        | CWC-1600/CWM-1109-2k |
| DS-3000  | FRP      | 30" x 18.5" x 32"                    | 26" x 18" x 31.5"                    | 32               | 8.4                        | CWC-2100/CWM-1714-2k |
| DS-3600  | FRP      | 36" x 22.5" x 34"                    | 32" x 22" x 33.5"                    | 42               | 13                         | CWC-2800/CWM-1714-3k |
| DS-3624  | FRP      | 36" x 18" x 24"                      | 32" x 17.5" x 23.5"                  | 32               | 8                          | CWM-1714-2k          |
| DS-3642  | FRP      | 36" x 22.5" x 42"                    | 32" x 22" x 41.5"                    | 50               | 15                         | CWC-2800/CWM-1720-3k |
| DS-4200  | FRP      | 42" x 26.5" x 36"                    | 38" x 26" x 35.5"                    | 52               | 19                         | CWC-3300/CWC-1720-3k |
| DS-4800  | FRP      | 48" x 32" x 36"                      | 44" x 31.5" x 35.5"                  | 65               | 28.5                       | CWM-1720-5k          |
| DS-4824  | FRP      | 48" x 30.5" x 24"                    | 44" x 30" x 23.5"                    | 46               | 16.5                       | CWM-2914-MS          |
| DS-6000  | FRP      | 60" x 38" x 42"                      | 56" x 39" x 41.5"                    | 90               | 45                         | CWM - 2920-2k        |
| DS-6024  | FRP      | 60" x 42" x 24"                      | 56" x 41" x 23.5"                    | 63               | 28.4                       | CWM 2914-2k          |
| DS-7200  | FRP      | 72" x 50" x 42"                      | 68" x 48" x 41.5"                    | 150              | 93                         | CWM-2920-2k          |
| DCS-2400 | GFRC     | 24" x 15.5" x 27"                    | 20" x 13.5" x 26"                    | 125              | 3.2                        | CWC-1600/CWM-1114-2k |
| DCS-2418 | GFRC     | 24" x 13" x 18"                      | 20" x 12.5" x 17"                    | 85               | 2.5                        | CWC-1600/CWM-1114-2k |
| DCS-3000 | GFRC     | 30" x 18.5" x 32"                    | 26" x 16.5" x 31"                    | 185              | 6.7                        | CWC-2100/CWM-1714-2k |
| DCS-3600 | GFRC     | 36" x 22.5" x 34"                    | 32 x 20.5" x 33"                     | 240              | 11                         | CWC-2500/CWM-1714-3k |
| DCS-3624 | GFRC     | 36" x 18" x 24"                      | 32" x 16" x 23"                      | 160              | 8                          | CWM-1714-2k          |
| DCS-4200 | GFRC     | 42" x 26.5" x 36"                    | 38" x 24.5" x 35"                    | 300              | 16                         | CWC-3300/CWM 1720-3k |
| DCS-4800 | GFRC     | 48" x 32" x 36"                      | 44" x 30.5" x 35"                    | 360              | 26.5                       | CWM-1720-5k          |
| DCS-4824 | GFRC     | 48" x 30" x 24"                      | 44" x 28" x 23"                      | 245              | 16                         | CWM-2914-MS          |
| DCS-6000 | GFRC     | 60" x 38" x 42"                      | 56" x 39" x 41.5"                    | 515              | 28                         | CWM-2920-2k          |
| DCS-6024 | GFRC     | 60" x 42" x 24"                      | 56" x 41" x 23.5"                    | 355              | 28                         | CWM 2914-2k          |

## Squares

| Part No.    | Material | Exterior Size<br>(top x bottom x ht) | Interior Size<br>(top x bottom x ht) | Weight<br>(lbs.) | Soil Volume<br>(cubic ft.) | Matching Irrigation    |
|-------------|----------|--------------------------------------|--------------------------------------|------------------|----------------------------|------------------------|
| DR/DCR-2400 | FRP/GFRC | 24" x 15.5" x 24"                    | 21" x 15" x 23.5"                    | 40/250           | 4.75/4.8                   | CWC-R1850/CWM-R1114-2k |
| DR-3000     | FRP      | 30" x 18.5" x 32"                    | 26" x 18" x 31.5"                    | 65               | 11                         | CWM-R2014-MS           |
| DR/DCR-3600 | FRP/GFRC | 36" x 22" x 34"                      | 32" x 22" x 33.5"                    | 75/475           | 16.75/16                   | CWM-R2014-2k           |
| DR-4200     | FRP      | 42" x 28.5" x 34"                    | 38" x 28" x 33.5"                    | 85               | 23                         | CWM-R2014-2k           |
| DR/DCR-4800 | FRP/GFRC | 48" x 26.5" x 42"                    | 44" x 26" x 41.5"                    | 110/700          | 33/30                      | CWM-R2020-4k           |
| DR-6000     | FRP      | 60" x 45" x 42"                      | 56" x 45" x 41.5"                    | 123              | 64                         | CWM-R2020-4k           |



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## Rectangles

| Part No.   | Material | Exterior<br>(top) | (bottom)      | (ht) | Interior<br>(top) | (bottom)    | (ht)  | Weight<br>(lbs.) | Soil Vol.<br>(cubic ft.) | Matching<br>Irrigation |
|------------|----------|-------------------|---------------|------|-------------------|-------------|-------|------------------|--------------------------|------------------------|
| DR-241818  | FRP      | 24" x 18"         | 20.5" x 14"   | 18"  | 20" x 14"         | 20" x 13.8" | 17.5" | 25               | 3.4                      | CWM-R1114-MS           |
| DR-361818  | FRP      | 36" x 18"         | 32.5" x 14"   | 18"  | 32" x 14"         | 32" x 13.8" | 17.5" | 35               | 5.3                      | CWM-R1114-2k           |
| DR-362424  | FRP      | 36" x 24"         | 29" x 17"     | 24"  | 32" x 20"         | 29" x 17"   | 23.5" | 40               | 8.5                      | CWM-R1120-2k           |
| DR-481818  | FRP      | 48" x 18"         | 44.5" x 14"   | 18"  | 44" x 14"         | 44" x 13.8" | 17.5" | 40               | 7                        | CWM-R1614-2k           |
| DR-482424  | FRP      | 48" x 24"         | 41.5" x 17.5" | 24"  | 44" x 20"         | 41" x 17"   | 23.5" | 45               | 11.5                     | CWM-R1620-2k           |
| DR-601818  | FRP      | 60" x 18"         | 56.5" x 14"   | 18"  | 56" x 14"         | 56" x 13.8" | 17.5" | 50               | 9                        | CWM-R2014-2k           |
| DR-602424  | FRP      | 60" x 24"         | 53" x 17"     | 24"  | 56" x 20"         | 53" x 17"   | 23.5" | 55               | 15                       | CWM-R2020-2k           |
| DCR-241818 | GFRC     | 24" x 18"         | 20.5" x 14"   | 18"  | 20" x 14"         | 18.5" x 12" | 17"   | 150              | 3                        | CWM-R1114-MS           |
| DCR-361818 | GFRC     | 36" x 18"         | 32.5" x 14"   | 18"  | 32" x 14"         | 30.5" x 12" | 17"   | 200              | 4                        | CMW-R1114-2k           |
| DCR-481818 | GFRC     | 48" x 18"         | 44.5" x 14"   | 18"  | 44" x 14"         | 42.5" x 12" | 17"   | 250              | 6.4                      | CWM-R1614-2k           |
| DCR-601818 | GFRC     | 60" x 18"         | 56.5" x 14"   | 18"  | 56" x 14"         | 54.5" x 12" | 17"   | 300              | 8                        | CWM-R2014-2k           |

## Site Furnishings (for more options, see the site furnishings detail sheet)

| Part No. | Code | Material | Shape     | Exterior Dimensions | Description  |
|----------|------|----------|-----------|---------------------|--|
| DS/DCS   | -TRS | FRP/GFRC | Round/Sq. | 24"dia x 30"H       | Round aluminum anodized trash lid, black, 9" opening (all).  |
| DS/DCS   | -ATR | FRP/GFRC | Round     | 24"dia x 30"H       | Round aluminum anodized ash-trash lid, black, 9" trash opening with 2.5" concentric ash ring.                          |
| DS/DCS   | -TFR | FRP/GFRC | Round     | 24"dia x 30"H       | Round FRP trash lid, color to match container, 9" opening (all round)  |
| DR/DCR   | -TFF | FRP/GFRC | Square    | 22"Sq. x 34.5"H     | Square FRP trash lid, color to match container, 9" opening (all square)  |
| DC/DR    | -AFR | FRP/GFRC | Round     | 22"Sq. x 34.5"H     | Round FRP ash-trash lid, color to match container, 9" trash opening with 2.5" inset plated-steel concentric ash ring   |
| DR/DCR   | -AFF | FRP/GFRC | Square    | 22"Sq. x 34.5"H     | Square FRP ash-trash lid, color to match container, 9" trash opening with 2 each 3" x 10" inset plated-steel ash trays |



**BETWEEN** LANDSCAPE  
+ARCHITECTURE



**Tournesol**  
SITE WORKS

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# **Guide Specification**

## **Tournesol Siteworks Fiberglass Planters and Planter Liners**

### **1.0 GENERAL**

#### **1.1 WORK INCLUDED**

- A. Provision of fiberglass planters and planter liners

#### **1.2 RELATED WORK**

- A. Section 03300 Cast-in-Place concrete
- B. Section 06100 Rough Carpentry
- C. Section 06200 Finish Carpentry

#### **1.3 SUBMITTALS**

- A. Product Data: Manufacturer's standard catalog cut sheets.
- B. Samples: As required for color selection or material thickness only.
- C. Shop Drawings: For custom applications, showing critical sizes and dimensions for installation and integration with other work.

#### **1.4 DELIVERY, STORAGE AND HANDLING**

- A. Unwrap and inspect planters and planter liners after delivery for signs of damage during transit.
- B. Protect planters and planter liners from damage during storage and handling.
- C. Store planters and planter liners indoors if possible. Do not stand or walk on planters or planter liners.

#### **1.5 PROJECT CONDITIONS**

- A. Contractor to provide adequate structural support for planter liner units. Unless otherwise specified, planters and liners should have continuous basal support.
- B. Protect units from damage by adjacent work.

### **2.0 PRODUCTS**

#### **2.1 ACCEPTABLE PRODUCTS/MANUFACTURERS**

- A. Fiberglass Planters and planter liners, manufactured by Tournesol Siteworks LLC. 30955 San Antonio St., Hayward, CA 94544 Tel: (800) 542-2282 FAX (510) 471-6243

#### **2.2 FIBERGLASS PLANTERS AND PLANTER LINERS**

- A. Materials - All parts shall be constructed of glass fiber reinforced polyester resin, using either the hand-layup or spray-layup methods.
  - 1. Glass fibers shall be PPG or equivalent. For hand layup fibers should be uniform chopped strand mat, minimum 3 oz. density. Smaller round containers will use one layer of mat (or spray equivalent), smaller squares and larger round containers must use two layers (or spray equivalent), larger square and rectangular containers must use min. 3 layers (or spray equivalent).
  - 2. Polyester resin shall be compounded by a reputable manufacturer. All planters and planter liners will be fabricated of 100% resin – inorganic fillers will not be acceptable.
  - 3. Gel coating (where necessary) shall be of specified color. Metallic finishes will use atomized metal thoroughly blended with polyester resin, and applied over clean surfaces.



4. Painted finishes will be made of polyurethane low VOC (less than 2.8 VOC) enamel with excellent corrosion and chemical resistance by PPG (AUE 280) or equivalent.

**B. Construction**

Architectural parts shall be fabricated by hand-layup, spray laminate, or resin transfer method using suitable molds to attain the desired surface finish. The finished reinforced plastic material shall be not less than 5/32" thick and thicker in those areas requiring additional structural strength.

Where ribs or stiffeners are to be fastened to liner sections by spray laminating over premolded forms, the stiffeners or ribs shall be located and spray laminated into position so that the finished joint shall conform to performance specifications below.

For vertical surface reinforcement, an inorganic honeycomb strengthening layer using double-veiled, bonded material shall be located and hand- or spray-laminated into position prior to the wall material setting. The entire honeycomb panel must be subject to pressure during curing to ensure proper bonding to wall. Honeycomb thickness will be minimum 1/4", or thicker as required for larger spans. Marine-grade plywood may be substituted for bottom panels to be penetrated with drainage or irrigation holes.

Interior of planter or planter liner to be waterproofed with additional layer of black gel coating, additional waterproofing available as specified.

**C. Performance characteristics and capacities, finished product to yield the following minimum performances:**

|                            |           |
|----------------------------|-----------|
| Hardness, Barcol           | 50        |
| Tensile Strength, Ultimate | 12500 psi |
| Elongation at break        | 1.3%      |
| Modulus of Elasticity      | 1020 ksi  |
| Flexural Modulus           | 754 ksi   |
| Flexural Yield Strength    | 27600 psi |
| Compressive Yield Strength | 21800 psi |
| Glass content, average     | 35%       |

Vertical wall panels will not deform more than L/200 when loaded with 80 lbs/cu ft. soil mass. Similar performance with heavier media is available per specification.

**D. Finish:** specified finish; factory finished.

**E. Sizes:** Modular units fabricated to size by manufacturer as required to fill specified areas. Refer to catalog for standard sizes. Custom sizes as per approved shop drawings.

**F. Fire retardant requirement** can be met with the addition of retardant chemicals to the resin. Additional information is available for this specification.

## **2.3 PLANTER ACCESSORIES**

**A.** Field installed drainage/irrigation connection fitting. Thread-by-thread thermoplastic drainage adapter, 1/2", 3/4" and 1"NPT female thread available. Contractor to locate drainage hole, drill as necessary, and install fitting.

**B.** Lifting hooks or stabilizer anchors, quantity, size, and capacity as specified.

## **3.0 EXECUTION**

### **3.1 PREPARATION**

**A.** Prior to planter or planter liner fabrication, the contractor shall verify as-built dimensions of planter area or receptacles to ensure proper size, fit and quantity required.<sup>1</sup>

**B.** Unless planters have drainage fittings as in 2.3.A, drainage holes to be located and made by contractor in the field to fit to drainage system.

### **3.2 INSTALLATION**

- A. Install planter liners to allow for easy removal if necessary.
- B. Provide continuous basal support.
- C. Install liners level to permit adequate drainage and irrigation.

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<sup>1</sup> Field verification of actual planter receptacle size is frequently overlooked by the contractor, and can lead to delays and additional cost if neglected.

## **Guide Specification**

**Section 129300** Site Furnishings

**Section 129200** Interior Planters

### **Tournesol Siteworks GFRC Planters, Saucers, and Site Furnishings**

#### **1.0 GENERAL**

##### **1.1 WORK INCLUDED**

- A. Provision of lightweight concrete planters, saucers, and sitefurnishings.

##### **1.2 RELATED WORK**

- A. Section 03300 Cast-in-Place concrete
- B. Section 06100 Rough Carpentry
- C. Section 06200 Finish Carpentry

##### **1.3 SUBMITTALS**

- A. Product Data: Manufacturer's standard catalog cut sheets.
- B. Samples: As required for color selection or material thickness only.
- C. Shop Drawings: For custom applications, showing critical sizes and dimensions for installation and integration with other work.

##### **1.4 DELIVERY, STORAGE AND HANDLING**

- A. Inspect GFRC products after delivery for signs of damage during transit.
- B. Protect planters and site furnishings from damage during storage and handling.
- C. Store planters and planter liners out of harm's way, in their original packaging.

##### **1.5 PROJECT CONDITIONS**

- A. Contractor to provide adequate structural support for planters and site furnishings.
- B. Protect units from damage by adjacent work. Clean units with water spray to remove workplace dust.

#### **2.0 PRODUCTS**

##### **2.1 ACCEPTABLE PRODUCTS/MANUFACTURERS**

- A. GFRC planters, saucers and site furnishings, manufactured by Tournesol Siteworks, 30955 San Antonio Rd., Hayward, CA 94544 Tel: (800) 542-2282 FAX (510) 471-6243

##### **2.2 GFRC PLANTERS AND PLANTER LINERS**

- A. Materials
  - 1. Portland Cement: ASTM C150, Type I, II, or III.
  - 2. Glass Fibers: Alkali resistant, with a minimum zirconia content of 16 percent, 1 to 2 inches long, specifically produced for use in GFRC.
  - 3. Sand: clean silica, complying with composition requirements of ASTM C144; passing No. 30 sieve with a maximum of 2 percent passing No. 100 sieve.
  - 4. Coloring Admixture: ASTM C979, synthetic mineral-oxide pigments or colored water-reducing admixtures, temperature stable, nonfading, and alkali resistant.

5. Water: Potable; free from deleterious material that may affect color stability, setting, or strength of GFRC ..
6. Polymer Curing Admixture: Acrylic thermoplastic copolymer dispersion complying with PCI MNL 130.

#### B. Construction

Architectural parts shall be fabricated by spray laminate method using suitable molds to attain the desired surface finish. The finished face mix shall be not less than 1/8" thick and thicker in those areas requiring additional structural strength. Where ribs or stiffeners are to be fastened to liner sections by spray laminating over premolded forms, the stiffeners or ribs shall be located and spray laminated into position before the section to which they are to be attached has passed the state of curing, and the finished joint shall be strong and durable.

1. Backing Mix: Proportion backing mix of portland cement, glass fibers, sand, and admixtures to comply with design requirements. Provide nominal glass-fiber content of not less than 5 percent by weight of total mix.
2. Face Mix: Proportion face mix of portland cement, sand and admixtures to comply with design requirements.
3. Polymer Curing Admixture: 6 to 7 percent by weight of polymer curing admixture solids to dry portland cement.
4. Coloring Admixture: Not to exceed 10 percent of cement weight.

D. Finish: specified finish; factory finished.

E. Sealing: Planters are to be dampproofed on the interior. Site furnishings and planters in the acid-etch finish are to be sealed, adding a mild sheen to the finish. Travertine products remain unsealed.

E. Sizes: Modular units fabricated to size by manufacturer as required to fill specified areas. Refer to catalog for standard sizes.

### 2.3 PLANTER ACCESSORIES (OPTIONAL)

A. Field installed drainage/irrigation holes. Drainage holes may be pre-drilled by factory, to specified location determined by client.

B. Drainage control products, including pump-out pipe, sleeved corrugated drainage pipe, and, if necessary, overflow drains and atrium drain covers.

### 2.3 SITE FURNISHING ACCESSORIES (OPTIONAL)

A. Anchoring elements to fasten benches and tables to surface. See specific product detail for exact type of anchor, mounting points.

B. Skateboard deterrent stops available for GFRC benches and stools as required.

## 3.0 EXECUTION

### 3.1 PREPARATION

A. Prior to fabrication, the contractor shall verify as-built dimensions of area for products to ensure proper size, fit and quantity required.

B. Unless planters have drainage fittings as in 2.3.A, drainage holes to be located and made by contractor in the field to fit to drainage system.

### 3.2 INSTALLATION

- A. Move product into position on pallets, where possible. Otherwise, slings are required, and must wrap the product fully.
- B. Provide continuous basal support for product.
- B. Install product level (or shim to level) to permit adequate drainage and irrigation.
- C. Refer to product detail and manufacturer instructions to determine proper location for anchor points. Use manufacturer template if available.